RAILROAD GAZETTE

FRIDAY, AUGUST 17.

Contributions.

Diagram for Train Despatchers.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your correspondent, Mr. Fowler, in his kindly comment upon my proposed "diagram for train despatchers," suggests an improvement in the apparatus. There is danger of contracting the size of the board to such an extent as to impair its usefulness. The size and shape of the dummies on my board, being pointed at one end, would indicate the direction of their motion. With Mr. Fowler's pins the color alone shows their direction. If each pin were supplied with an arrow head, the point would suggest the direction of the train, and thus both form and color would appeal to the eye With this, or some similar amendment, I heartily endorse the improved diagram.

While on the subject of train-dispatching, I will mention another matter suggested by an old road-master at my elbow. Almost every railroad has among its rules one which is considered as unalterable as the laws of the Medes and Persians. It is to the effect that when train orders are being sent over the wire, no operator shall "break" under any circumstances. A case may arise, however, where the train-dispatcher might be glad to have his train order interrupted. The occurrence of a wreck would perhaps cause the dispatcher to change the train order he was at that moment transmitting. In such a case it would be proper for an operator to break and give the dispatcher information of the wreck. So also in clearing the track at a wreck. It is a difficult matter to guess at the time which will be required to clear off a wreck. The road-master may have telegraphed that it would take six hours to clear the track, and the dispatcher arranges a scheme of train orders based upon that information. It may happen that good luck attends the wrecking gang, and after three hours' work they can see that the track will be clear in another half-hour. This is information which the dispatcher ought to have at once even if he is engaged in sending a train-order.

It would seem desirable to have the above-mentioned rule amended so that a "wreck message" from an authorized person should have precedence over a train order.

T. APPLETON.

A Short Chapter on Rail-Joints.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Next to the much-invented car-coupler come the innumerable cranky rail joint supports and fastenings. Like the inventors of automatic car-couplers, the men of genius who are seeking for a perfect rail-joint have very imperfect ideas of what is required of them; or, to use a popular and somewhat inelegant expression, the man who guarantees to furnish a rail-joint that is satisfactory in every particular "has bitten off more than he can chaw." It is not meant to say that a perfect joint cannot be produced, for there are some in use that need but little improvement to render them *nearly* all that is desired in that line. Unfortunately, however, there are but few roads that are equipped with the best joint fastenings known, and many thousands of miles of track are fitted with very imperfect joint fixtures. Every one of an inventive turn who notices the countless rattletrap devices tries his hand at a new rail-joint. He makes a model and puts it together with all manner of grips, clamps, lips, wedges, keys, bolts, nut-locks, spikes, splice-bars, etc., etc., and it looks as though it would hold the rails in place forever. He manages through some art not generally known to inventors, to get one or more roads to adopt his alleged improvement, and some other inventors are equally fortunate with their contrivances, and all concerned discover when too late that "chewing the string is not a test of the pudding."

There is scarcely anything more desirable in railroad operation than a joint fastening and support that fills the bill, but it is certainly an unwise policy to equip a long line of road with fastenings that have not been subjected to a thorough practical test. If a railroad official is not satisfied to use the best fastenings in use, and has faith in a dozen, more or less, of recent inventions, he can give them all a trial and select the best as a standard. But we need the "American Experimental Railroad" to test all things for the entire railroad system. Then railroad managers can get the best and always be sure of getting something worth having.

A recent trip over a road some hundreds of miles in length, a good share of which has lately been relaid with steel rails on new ties and well ballasted, showed that the managers have made a mistake in their selection of joint fixtures. They are using a splice-bar (4-bolted) that is quite extensively used, and a nut-lock that is bringing wealth to the patentees and manufacturers; but the joints are all loose and the rails are pounding down at the ends. Too much noise for a first-class road caused the writer to pay attention to the matter and discovered the cause of the clatter, which reminded one of the early days of railroads, when the speed of the train was known by the sound of the wheels at the joints—which is not the case on our best roads of to-day.

While most inventors of rail-joints fall short of their aim, others overdo the thing and get the joints too stiff. It is of the utmost importance that rails have the same strength at the joints as other parts and no more. There is a certain amount of depression of all rails, and this keeps a certain distance in advance of the wheels, causing a "wave of depression," and the most desirable joint is one that will transmit the wave unbroken to the next rail and return to its normal position. If the rails are bound by too rigid clamps or grips, the wave is broken, and rolling stock is badly shaken up in consequence.

A brief consideration of the various forces which tend to destroy joints will give inventors of those fixtures something of an idea of what is expected of them when they inform the railroad public that they have invented a perfect rail-joint: It must be capable of resisting vertical strains varying from a few hundred pounds (the weight of the wheels of an empty car) to as many tons (the weight on driving wheels), providing always that they yield to the pressure the same as the middle of the rails, and retain sufficient elasticity or spring to regain their position on a plane with the rail centres. The splice-bars and other vertical supports must be of such a nature that they will not bend and set, under any amount of pressure. The nuts, keys, wedges or other fastenings must resist the ever-changing jar and vibration incident to the various weights of wheels and speeds at which trains are run, as for instance: The first load is a heavy locomotive truck, the next the heavier drivers, then the lighter tender trucks, then the trucks of an empty freight car, followed by those of a loaded one, and so on through a long freight train, the amount of depression changing from the minimum to the maximum and *vice versa*, with astonishing rapidity. And from the fast express train to the slowest freight, the joints are subjected to a punishment ranging from the slightest to the most severe, the light taps sandwiched between the heavy blows in a thoroughly demoralizing manner, one blow being delivered before the joint has fully recovered from the preceding one. All this has a tendency to wear all the parts that enter into the make-up of a rail-joint, which soon causes a vertical motion of the rail ends, throwing them out of their plane and exposing them to the pounding of the wheels, which is an expensive operation. The lateral strain on joint fixtures must also be provided for. Bolts may be made fast with the most approved nut-locks, keys or other devices, but they *very soon get loose*, and then comes rapid destruction of rails and ditching of trains. Bolts that are made very tight are liable to break by contraction in severe weather, or if not broken they stretch so that they will be loose when the weather gets warm, and no nut-lock has yet been produced that will compensate for contraction and expansion and the cranky, hashed-up vibrations and mixed strains before mentioned. The splice-bars must be kept snug to the rails or they are no support whatever; and the splice-bars in common use and the general make-up of the average rail-joints are the most unmechanical and unsatisfactory of all railroad appliances.

Another source of trouble with the common splice-bars is that when they become a trifle loose (and it is exceedingly rare that they are perfectly tight), the end of the rails will "cock up" when the wheels have passed the joint. In this way the ends of the rails have a vertical motion sufficient to expose them to severe pounding. Suppose the rear truck of a car has passed the joint just far enough to bring the forward wheels of the next car close to the joint. The end of that rail will be depressed, while the next rail will be raised all that the looseness of the joint will allow. The first mentioned truck depresses the rail on which it rests 6 or 8 feet from its end. A tie between the wheel and the joint acts as a fulcrum, and the end of the rail rises at the same time that the end of the adjoining rail goes down. Thus the rails have a rocking motion, a tie a few feet from the joint acting as a fulcrum, and at the time that one rail goes down the other rises with the above-mentioned results. And the contraction and expansion of the rails have a destructive effect on joints; also, the counter-weights on driving wheels, and it is difficult to conceive of anything that presents a greater array of difficulties to be overcome than the rail-joint. Every destructive mechanical force imaginable, and the elements also, are in constant warfare with that most abused of all railroad appliances. A perfect joint must be to all intents and purposes the same as any other parts of the rail as to strength and elasticity. Many or all of the joints now in use would be far more serviceable if they were better cared for by trackmen. Many joints are destroyed by too much power on the long wrenches, by which the bolts are twisted off. Fairly snug is tight enough if kept so.

WM. S. HUNTINGTON.

Curative Measures for the Detention of Cars.

BOSTON, Mass., Aug. 14, 1883.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The movement of foreign cars in and from New England has greatly improved in the last three years. The conditions of the detention of cars there are more apparent than at perhaps any other point in the country. The working of curative measures, therefore, is presented in the light of a considerable number of accomplished facts and unremoved difficulties. Both these sight-lights are necessary to any fair consideration of new and untried measures.

The law of Massachusetts affords no special protection to the railroad against the detention of its cars by the neglect of shippers to unload their freight. There has been, I believe, one decision in a suit brought, if I am not mistaken, after due notice had been given that a charge for demurrage would be made in case the freight was not unloaded at a stated time. Marine demurrage is charged and collected upon a basis of customs which have become very stringent. Apparently the consignor of freight by sea-going vessels is in a measure responsible for delays indirectly due to natural causes. In case of delayed arrival and consequent incoming of vessels *en masse*, the consignee is obliged to pay demurrage, although the amount of freight to be unloaded far exceeds his capacity to take it from the vessels. No such custom has grown up as regards railroad service. The nearest approach to it has been the habit of a few roads to warehouse freight within 48 hours after its arrival; but even this nucleus of a custom was injured when new railroads were opened and competition became more severe In the absence of experience, all the questions involved in the exaction of a demurrage charge are not, as I have too much reason to believe, perfectly clear in any minds. There appears to be some doubt whether the ordinary contract with the shipper is sufficient to cover safely the legal exaction of demurrage, except some other notice or requirement has been made to the consignee. It is evident, however, that in the absence of some special ground common to all roads, there will be practically no collection of demurrage. It is in this sense that the law prevents demurrage, if one may define prevention after the manner of the little boy's description of salt—"What makes potato taste bad when there isn't any on it."

Many years ago, the general freight agents of the New England railroads succeeded in bringing before the Legislature of Massachusetts a bill providing for a demurrage charge on cars; but they were immediately met by certain of the most influential men of the state, some of them treasurers of their own companies, who introduced an opposing bill compelling the railroad to unload the freight and place it in warehouse after a certain time, no charge, I believe, to be made for storage for one or two days. The consequence naturally following was that neither bill was passed. Warehouses for various and often bulky freights are neither easily provided nor easily carried on by a railroad company. As it is, the railroad is the storehouse and delivering agency for numerous small dealers who possess only office facilities, and look to the carrier to act as their commercial storekeeper. Under the present condition a law obliging the road to unload lumber, grain, hay, etc., before it can obtain a legal basis for a demurrage charge, is practically a benefit only to the consignee. I ought to say, however, this interpretation of the legal and various other aspects of the demurrage question, although made after some investigation into the views and experience of others, is one for which I am alone responsible.

There are many interesting facts in regard to the movement of cars here which bear upon the proposed method of a *per diem* charge. Perhaps the strongest argument against such a method is the number of exceptions which would be required to make the free movement and proper detention of cars possible. For example, during the extreme scarcity of cars last fall, one of the causes not without influence here was the delay of foreign steamers by bad weather. Another example of ground for an exception is offered at slack times, when it is to the general interest of economical operation that cars should return as far as possible loaded. The delay involved in the carriage and delivery of such freight as can be obtained in New England is by no means always a loss. Wood, for example, is a kind of freight involving all sorts of delay—a car-load of wood very commonly lies two weeks in Boston unloaded; yet it may be economical to load with wood.

I give these facts not as serious objections against the *per diem* method, but as representative of a class of cases, and possibly a very large class, that must be met.

The closer one comes into contract with the details of movement of cars, the more apparent the need appears for flexibility of method, until the conviction arises that only an organization intelligent and with authority to make any required adaptations and changes is fit to deal with the difficulties involved.

New England offers a suggestion—a mere suggestion—as to a possible organization, which in some modified form could be extended over the entire country. I may take up the question of such a clearing-house organization in another letter. It is better, however, to begin here with a few facts as to its working in New England. There is no question that it has been the principal means in effecting a great improvement. When one compares the present with the past as known by the foreign car accountant, there has been a very radical change in car administration here. I have reason to believe that, with an exception which I shall note later, few or no foreign cars are used in New England for local service other than such as may be for the interest of their owners. A few years ago, to trace a car which had once fallen into the clutches of local station agents was only to be compared with an attempt to catch a flea. Such cars seemed to have an unusual rapidity of movement, and as their motion was backward as well as forward, or in any direction which the local freight agents found it convenient at the moment to load and send them, tracing was almost an impossibility. At present it is necessary only to call at the office of the Clearing-House to see for one's self all the facts of a car's movements. New England is treated as the territory of one road, and where there are so many small and devious lines, this fact is of the greatest advantage to the car tracer. The method necessarily involves some delay, and information may be several days old, but the gain to the discovery of the car compared with old methods is something delightful. Moreover, such a continuous record on books opened to the inspection of interested parties has done very much toward

preventing the misuse of cars by the local agents. It is safe to say that for such a net-work of small roads, a remarkable thing was accomplished when the Clearing-House was set in motion; and although adapted in a peculiar way to local conditions here, any suggestions from it as a fact should not be left out of account in considering measures for the general improvement of car service.

There is needed and already existing on some roads a car agency which supplements the Clearing-House. One newer road working more miles of track than perhaps any other is seriously at fault, since it evidently relies entirely upon the Clearing-House. My information comes from more immediate knowledge of its affairs and not from the Clearing-House; but there is no doubt that not a few foreign roads are suffering various sort of injustice because this one makes no provision for personal supervision over cars on its tracks. No clearing-house can entirely relieve a road from care over its own cars and interests connected therewith; but one would be hasty in deciding without experience that there is any radical opposition between a proper clearing-house service and a lively individual oversight over a car service of each road.

I would not give the impression that the Clearing-House has been the only agency in the reformation which has taken place here; but, rather, that it has been an influence everywhere felt. In a measure, evils have tended to cure themselves. Better facilities for unloading coal and grain, for example, have been the consequence of past difficulties in handling such freight. Railroad men here deserve long credit marks for what they have done to improve on the past. With the exception of those conditions due to the absence of a proper law, the car service here is in a very healthy condition.

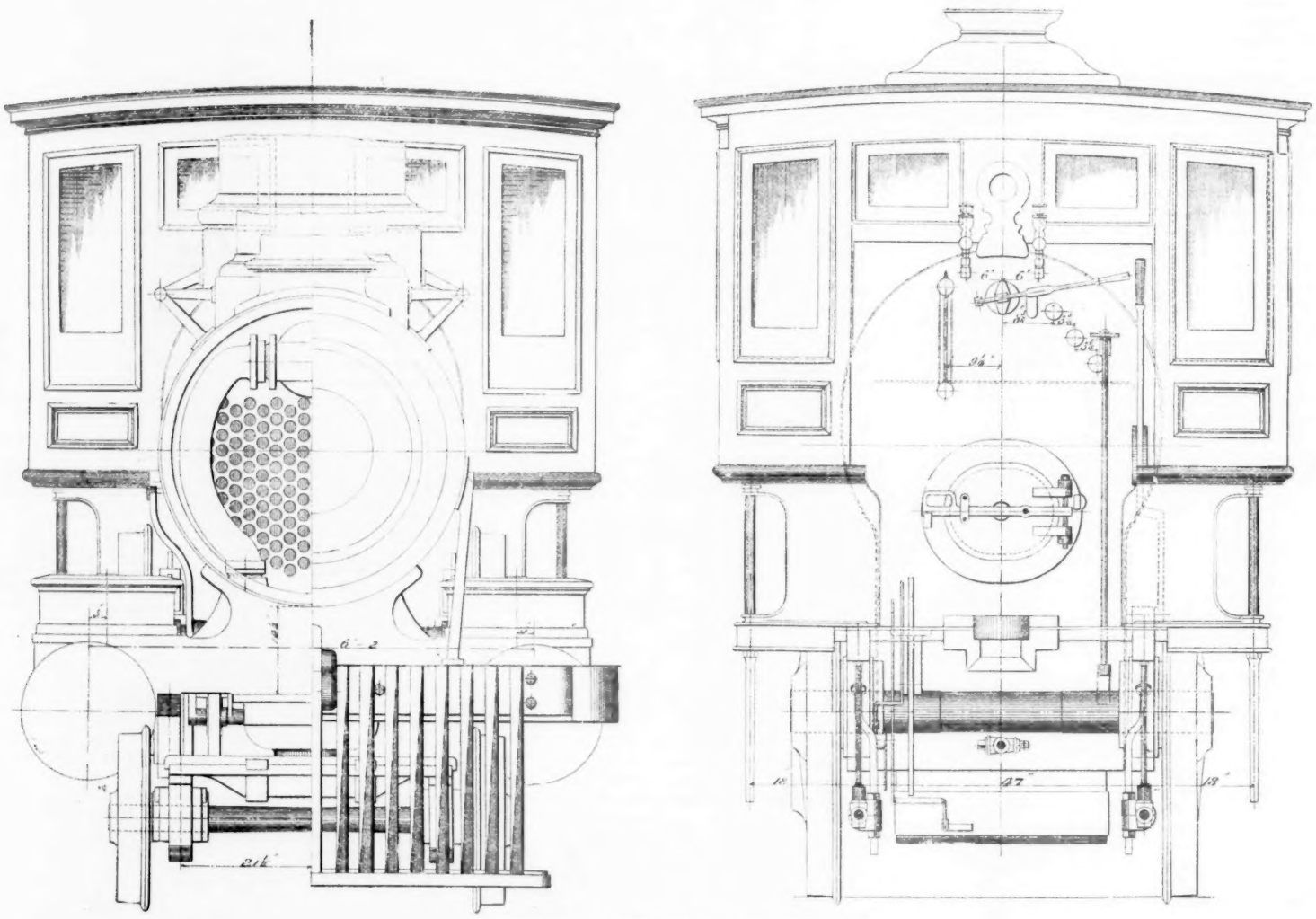
X. Y. Z.

Standard Passenger Locomotive Built by the Brooks Locomotive Works.

Continuing our illustrations of the locomotives at the Chicago Exposition of Railway Appliances, we give this week a double-page engraving of a standard passenger engine exhibited by the Brooks Locomotive Works. The following is the specification of this engine furnished by the builders:

GENERAL SPECIFICATION FOR STANDARD-GAUGE PASSENGER LOCOMOTIVE.

Type.—American pattern.
Gauge.—4 ft. 8½ in.
Cylinders.—17 in. diameter; 24 in. stroke.
Driving Wheels.—Four in number, 67 in. diameter outside of tire.
Tires.—Flanged; 61 in. inside diameter; 5½ in. wide, and 3 in. thick. Made by Standard Steel Works.
Boiler.—Wagon top style. Made of Otis homogeneous cast steel. Diameter at smoke-box end 48 in. Thickness of plates, ⅜ in. Flue sheet, ½ in.
Fire-Box.—Made of Otis homogeneous cast steel; 66 in. long, 34 in. wide at grate, 43½ in. wide at crown sheet, 64 in. high. Thickness of plates, side and door sheets, ⅝ in. Crown sheet, ⅜ in. Flue sheet, ½ in. Water space, 3 in. sides and back; 4 in. front.
Flues.—Lap-welded iron. 166 in number, 2 in. outside diameter, 11 ft. 6 in. long. Set with copper thimbles at fire-box ends.
Axles, Driving.—Hammered iron. Journal 7 in. diameter, 8 in. long.
Axles, Engine Truck.—Hammered iron. Journals 4½ in. diameter, 9½ in. long.
Axles, Tender.—Hammered iron. Journals 3¾ in. diameter, 7 in. long.
Wheels, Engine Truck.—30-in. spoke. Made by Bowler & Co., Cleveland, Ohio.
Wheels, Tender.—33 in. double plate. Made by Bowler & Co., Cleveland, O.
Crossheads.—Cast steel. Made by Eureka Steel Castings Co., Chester, Pa.
Crank Pins.—Made of Otis steel. Main bearing, 4 by 4 in.; side rod wrist, 3 in. diameter, 3¼ in. long.
Slide Bars.—Hammered iron, case hardened.
Links.—Hammered iron, case hardened, forged solid.
Feed Water.—One brass pump on left-hand side and one No. 7 Friedman non-lifting injector on right-hand side. Cock in feed pipe regulated from footboard.
Steam Gauge.—6¾-in. dial. Made by Crosby Steam Gauge & Valve Co., Boston, Mass.
Headlight.—23 in. Made by Kelly Lamp Co., Rochester, N. Y.
Cylinder Packing.—Dunbar's patent.
Safety Valves.—One 2½ in. Crosby pop, and one flat valve with lever and scale in cab.
Springs, Driver.—Made by A. French & Co., Pittsburgh, Pa.
Springs, Engine Truck.—Made by A. French & Co., Pittsburgh, Pa.
Springs, Tender—Made by National Car Spring Co., N. Y.
Tender.—Eight wheeled, forward truck centre bearing, rear truck centre and side bearing. Frame of oak, well braced; outside sills bound with iron.
Tank.—Capacity, 2,640 gallons water. Plates of No. 6 iron, with angle iron corners, well braced.
Wheel Base.—Driving wheels, 8 ft.; engine, 22 ft., 7 in.; engine and tender, 42 ft., 6 in.
Brakes.—Westinghouse automatic, and hand brake on tender.
Grate.—Area, 16.45 square feet.
Ash Pan.—Suitable for the fuel, double dampers operated from the footboard.
Heating Surface.—Fire box, 103.21 square feet; flues, 989.56 square feet; total heating surface in boiler, 1,092.77 square feet.
Weights.—Weight of engine empty, 66,000 lbs.; weight of engine in working order, 74,000 lbs.; weight on drivers, 48,000 lbs.; weight on engine truck, 26,000 lbs.
Tonnage.—This engine will haul in addition to the weight of engine and tender, the track being in good condition and comparatively free from curves: On a level, 1,150 gross tons; on a 20-ft. grade, 545 gross tons; on a 40-ft. grade, 343 gross tons; on a 60-ft. grade, 242 gross tons; on an 80-ft. grade, 182 gross tons, and on a 100-ft. grade, 141 gross tons.



STANDARD PASSENGER LOCOMOTIVE.

By the BROOKS LOCOMOTIVE WORKS, *Dunkirk, N. Y.*

Southern Railway & Steamship Association.

Pursuant to call of the General Commissioner, as per Circular Letter No. 52, Series of 1882-83, the Executive Committee met at the office of the Association, in Atlanta, Ga., 3:30 p. m., Wednesday, Aug. 8, the following members being present: Messrs. Henry Fink, W. G. Raoul, T. M. R. Talcott, M. H. Smith, John Scott, B. D. Hasell and R. A. Anderson.

Absent—Messrs. John B. Peck, H. S. Haines, R. R. Bridgers and J. W. Thomas, who were represented by the General Commissioner, as per Articles of Agreement.

There was also present, by request of the General Commissioner, nearly all the members of the Rate Committee, Col. T. H. Carter, Arbitrator of the Association, and a number of other railroad officers, among them Hon. Jos. E. Brown, President Western & Atlantic Railroad and of the Association, who appeared in behalf of the merchants of Atlanta.

The call having been read by the Secretary, it was determined to take up as first business the question of rates to Atlanta. Upon request, a circular (No. 2) of Atlanta Chamber of Commerce was read. The whole subject of rates to Atlanta was then thoroughly discussed between members of the Committee and Hon. Jos. E. Brown, who spoke forcibly in favor of reducing the rate to Atlanta, citing numerous reasons for this. After full interchange of views, the following resolution, offered by Mr. John Scott and seconded by Col. T. M. R. Talcott, was unanimously adopted, viz:

"*That whereas*, It is alleged that Atlanta is discriminated against by reason of the disparity in rates to that city as compared with those of other cities; be it

"*Resolved*, That with a view to intelligently investigate and consider the grievances so described, the General Commissioner be instructed to prepare and submit classified statistics for each of the twelve months ending June 30, 1883, showing business from Knoxville, Chattanooga, Montgomery, Rome, Atlanta, Macon and Augusta, to local territory competitive between the points named, and that such statistics shall be referred to the Executive Committee for their information and action; a meeting of that Committee being called by the General Commissioner immediately after the completion of the statistics."

Next question taken up was the classfication of coal oil in tank cars and coal oil in barrels by car-load. Mr. Anderson moved that the classfication remain as now in force. Motion seconded by Mr. Smith and carried.

The classfication of domestics, etc., of paper and woolen goods—all the product of Southern mills—when shipped direct from mills, was next considered and discussed at some length. Mr. Fink moved that the present classification on domestics, etc., remain in force, except that the words "North, East and West" be stricken out. Motion carried.

Mr. Anderson made similar motion in reference to paper and woolen goods, which was also carried.

The Secretary read a communication from the Committe on Transportation of the Board of Trade of Chattanooga, stating that Chattanooga was discriminated against in rates, and asking reductions.

Upon motion of Capt. W. G. Raoul, action on this communication was deferred until the statistics, as called for by resolutions adopted in reference to Atlanta rates, etc., are prepared and submitted.

The basis of cotton rates between all points was next discussed.

Mr. Smith moved that the present rates be continued in force. Seconded by Mr. Fink.

Capt. Raoul offered as a substitute the following, which was seconded by Mr. Hasell:

"*Resolved*, That the differences between rates to Norfolk, Richmond, etc., and to Charleston, Savannah, etc., be 20 cents per 100 lbs., and that the Rate Committee is hereby instructed to observe, as a principle in fixing rates, that no rate between given points shall be fixed at a lower rate per mile than is fixed for a longer distance over the same line."

Upon the vote being put on the substitute, it was not adopted—the vote standing:

Ayes—Messrs. Raoul and Hasell.

Noes—Messrs. Fink, Talcott, Scott and Smith.

The vote was then taken on Mr. Smith's original motion, resulting in non-adoption. Rules require all action to be unanimous. Vote being:

Ayes—Messrs. Fink, Talcott, Scott and Smith.

Noes—Messrs. Raoul and Hasell.

Captain Raoul demanded that the question go to arbitrators for decision, as per articles of agreement.

Upon the next question, "Pooling of Business *via* the Shenandoah Valley Route from the Eastern cities, Boston, New York, Philadelphia and Baltimore," being called, Mr. Fink stated he had agreed to pool that business.

The question of pooling business from interior towns adjacent to the Eastern cities of Boston, New York Philadelphia and Baltimore was discussed, but no agreement could be reached to pool that business. It was therefore agreed that that business should not be pooled by any line, but that all lines should report to the General Commissioner for information, etc.

Upon reading of the next sentence in the call—sentence announcing that it had been agreed to pool business *via* sail vessels—Mr. Fink objected, and stated he would not so agree, unless all the business from the Southern ports proper was also pooled.

To this Captain Raoul objected, and the General Commissioner stated that Colonel Peck also objected.

That question was therefore passed over for the present, with the view of an attempt to reach an agreement between lines interested outside of committee meeting.

Upon motion of Mr. Smith, the question of increasing the number of members of the Rate Committee was deferred, the members of the Executive Committee asking the increase not being present.

On motion of Mr. Fink, the committee adjourned subject to the call of the General Commissioner.

RATE COMMITTEE.

A meeting of the Rate Committee was held after the adjournment of the Executive Committee, on call of the General Commissioner. Some changes in classification were adopted, and the General Commissioner was requested to investigate and report to the committee whether shipments of hoop iron, sheet iron and other iron, and steel manufactures had been made from Pittsburgh under improper or false bills of lading, so as to secure the benefit of the special rates on bar iron and nails.

The following was unanimously adopted:

"*Note* 8—*Car-Load Rates.*—In all cases in which the classification provides a rate per 100 lbs., per ton or per barrel, according to the car-load (C.L.) shipments lower rates than applies to shipments less than car load (L.C.L.) the standard minimum weight for a 'car load' shall be 24,000 pounds. Excess over this weight shall be charged in proportion. Where the classification specifies a lower minimum, such standard shall govern, except where actual weight loaded is in excess of minimum, in which cases excess charge in proportion shall be collected.

"*Provided*, That in no case is it required that the amount collected on less than car load shall exceed the price per car load.

"'Car-Load Rates' applies to one shipment to one consignee of one article of freight to secure reduced rates where provided for by the classification. Agents should have notice of the shipment, and entry be made on the bills of lading—'Car-Load Rates,' which should be signed by the agent."

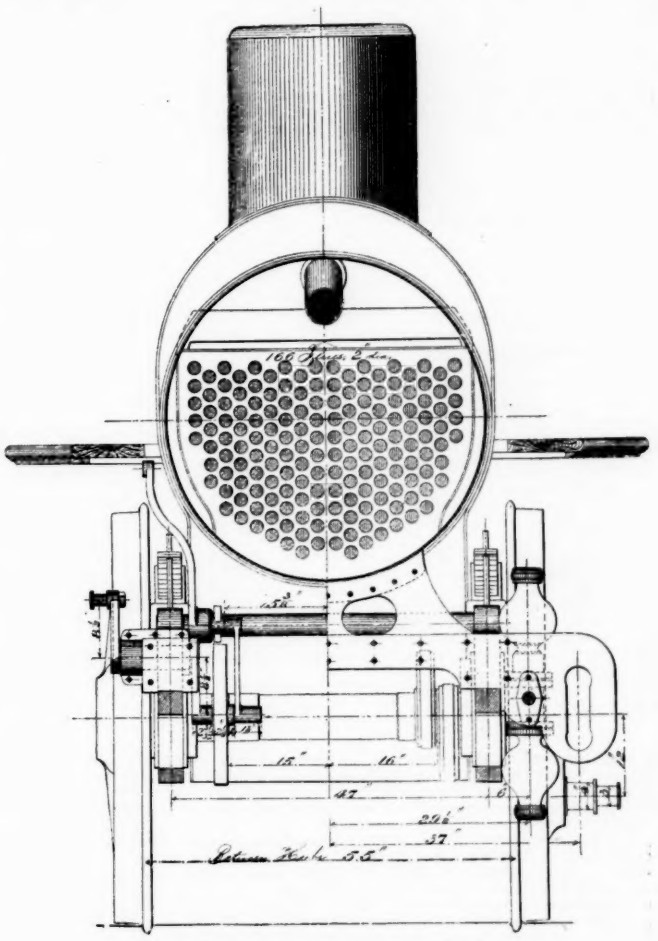
It was resolved that the rates on bagging and ties from Boston, New York, Philadelphia and Baltimore to all points be reduced 3 cents per 100 lbs., taking effect Aug. 15, by the issue of a special circular, no other articles in Class A to be reduced.

It was also resolved that the classification be reprinted, covering the ratings made at this session, and those named in Circular Letters Nos. 46 and 54, Series, 1882-83, the revised classification taking effect Sept. 1, 1883.

The Webb Compound Locomotive.

We give below a paper recently read before the English Institution of Mechanical Engineers, by Mr. F. W. Webb, on the compound locomotives designed by him and now in use on the London & Northwestern Railway, and also a summary of the discussion (taken from *Engineering*) which followed the reading of the paper. An illustration and description of Mr. Webb's engine was published in the *Railroad Gazette* of March 31, 1882, page 19. Mr. Webb's paper is given as follows by the London *Engineer*:

The object of the present paper is to show what advantages may be obtained by compounding the locomotive engine, and how this may be practically carried out without materially adding to the weight or complicating the working parts. The subject is not a new one, as it has been dealt with in this Institution—"Proceedings," 1879, page 328—by M. Mallet, with regard to the Bayonne & Biaritz Railway. He succeeded in obtaining an econominal engine, but in a form not likely to be a steady one at high speed; great credit, however, is due to him for the attention he has given to the subject. About five years ago the author converted an old outside-cylinder engine with 15-in. cylinders into a compound, on the plan adopted by M. Mallet, by lining up, one of the cylinders, and reducing it to 9 in. diameter. This engine has until the last three months been working light passenger trains on the Ashby & Nuneaton Branch of the London & Northwestern Railway, and the elements of success seen in its workings led to the construction of the compound locomotive "Experiment," which was what its name implies. The two main objects the author had in view when designing the "Experiment" were—firstly, to attain greater economy in consumption of fuel; and secondly, to do away with coupling rods, while at the same time obtaining a greater weight for adhesion than would be possible on only one pair of driving wheels without rapid destruction of the road. The driving wheels being no longer coupled, there is less grinding action in passing round curves, and it is not even necessary that one pair should be of the same diameter as the other. The engine "Experiment" was constructed at the Crewe locomotive works in the latter part of 1881, and has now been at work over 12 months, and run nearly 100,000 miles, chiefly with the Scotch and Irish limited mails. While on this work it made a daily run of 319 miles, and this being a longer mileage than the engines are accustomed to run in the time, two drivers and firemen were appointed to work the engine, one from Crewe to London and back one day, and the other the day following, in order thoroughout to test the engine in every way before building any more of a similar class. The engine has throughout proved itself to be very steady when running, which is no doubt due to the arrangement of the cylinders; the engine being practically balanced, and having no coupling rods, is enabled to run at very high speed. The principle having been proved correct, it was thought advisable, owing to the increasing weight and high speeds of passenger trains, that in designing the new engines they should be made more powerful than the present type. Accordingly the high-pressure cylinders have been increased from 11½ in. to 13 in. diameter leaving the low-pressure cylinder of 26 in. diameter the same as at present, with the exception of the ports, which have been increased from 1⅛ in. by 14 in. to 2 in. by 16 in., in order to give more freedom for the exhaust. There are two outside high-pressure cylinders of 13 in. diameter, and one inside low-pressure cylinder of 26 in. diameter, the stroke in each case being the same, namely, 24 in. The two high-pressure cylinders have their steam-chests placed underneath, in order to allow the valves to fall from their faces; so that there is no wear when the steam is shut off. These two cylinders are attached to the outside frame plates immediately under the foot-plate, about midway between the leading and middle wheels, and are connected through their piston rods and connecting rods to the trailing wheels. The low-pressure cylinder, which has its steam-chest on the top, is placed directly over the leading axle, and is carried between two cross steel plates, one at either end, securely fixed between the main frames; its connecting rod lays hold of a single-throw crank on the axle of the middle pair of wheels. Steam is supplied through the regulator in the dome to a brass T-pipe on the smoke-box tube-plate, and thence by two 3-in. copper steam pipes first running parallel to the tube-plate, then through the back plate that carries the low-pressure cylinder, and between the plates of the inside and outside frames, to the steam-chests of the high-pressure cylinders. The exhaust steam from these cylinders is returned by two 4-in. pipes, running parallel with the high-pressure pipes, through the back plate that carries the low-pressure cylinder and into the smoke-box; following round the curved sides of the smoke-box nearly to the top, each pipe passes across to the opposite side, and enters the steam chest of the low-pressure cylinder through passages in the cover. Thus the exhaust steam becomes superheated in these pipes by the waste gases in the smoke-box, while the large capacity of the pipes themselves obviates the necessity for a separate steam receiver. The final exhaust escapes from each side of the steam-chest of the low-pressure cylinder into the blast-pipe, and thence to the chimney in the usual way, the only difference being that there are only half the number of blasts for urging the fire compared with an ordinary engine; yet the compound engine steams very freely, and has a blast-pipe of 4¾ in. diameter for the final exhaust, compared with 4½ in. in engines of the ordinary type. The steam-chest cover of the large cylinder is provided with a relief valve, so adjusted that the pressure admitted may never exceed 75 lbs. per square inch; and a small pipe, which is connected to the low-pressure steam pipe, and carried back to a gauge fixed inside the cab, shows at a glance the actual pressure of steam being used in the large cylinder. Arrangement is also made whereby steam direct from the boiler can be admitted to the low-pressure cylinder, which is useful for warming up before starting. The valve motion adopted for this engine is that designed by Mr. David Joy, and described at a former meeting, which does away with all eccentric rods, and considerably reduces the number of working parts per cylinder, as well as the weight of the valve gear. The arrangement, however, for the new engines, differs slightly from that on "Experiment," in order to do away with the trunnion bearings on the foot-plate. The total number of working or moving parts for the three sets of valve motion in the compound engine is 29, and their total weight 284 lbs.; while the number of working parts in the two sets of valve motion in the ordinary standard engine is 24, and their weight 793 lbs.; the reversing shafts in each case not being taken into consideration. The valve chests being on the underside of the high-pressure cylinders, the motion disks carrying the quadrant bars have to be placed in a corresponding position; and this is done by securing them to the underside of the slide bars. The quadrant bars, which are made of soft steel, case hardened, are each grooved to a radius equal to the length of the valve-rod link, and working in their grooves are brass side blocks, carried by the lifting links, to the lower end of which is attached the valve-rod link, and to the upper end the compensating link on the connecting rod; the upper end of the compensating link is controlled by a rod attached to a return crank on the trailing crank pin. The quadrant bars are lengthened out below the disks, so as to allow attachment to be made, by the link with the reversing shaft placed behind the trailing wheels. The reversing is effected by means of a screw and lever arrangement connected to the reversing shaft. The high-pressure slide valves are of the Frick or Allen type, which give double the lead shown at the edge of the port when the piston is at the end of its stroke; they have a travel of 3⅛ in. in full forward and backward gear. The lap is ¾ in. and the lead 1⅛ in.; the port opens ¾ in. for admission and closes at 70 per cent. of the stroke. The sizes of the ports in the cylinders are, steam, 1⅛ in. by 9 in.; exhaust, 2⅛ in. by 9 in. The valve motion of the low-pressure cylinder differs slightly from that of the high-pressure. Instead of disks there is a cast-iron shaft, carried in brackets, which are fixed to the inside frames, and the quadrant guides are bolted to it in the middle of its length. The other parts of the motion are similar to those of the high-pressure cylinders, the only difference being that the end of the compensating link in the low-pressure motion is attached to a radius rod centered on the back plate of the cylinder. At one end of the reversing shaft is fixed a lever, which is coupled direct by a long rod to a reversing handle on the foot-plate. The travel of the valve in full gear is 4½ in.; lap of valve, 1 in.; lead, 1/16 in.; the port opens 1 in. for admission, and is closed at 75 per cent. of the stroke, and the exhaust closes at 93 per cent. of the stroke. The sizes of the ports are, for steam, 2 in. by 16 in.; exhaust, 3¼ in. by 16 in. The reversing gears of the high and low-pressure cylinders are designed to work independently of each other, and no inconvenience has been experienced by this arrangement; they could, if desired, be connected, but this would mean complicating the parts, while no material advantage would be gained. With regard to the degree of expansion at which the engine is worked, in practice the low-pressure cylinder is kept nearly in full gear, while all the expansion is done in the small high-pressure cylinders, so that no more steam is used than is absolutely necessary to do the work. The commercial results with the engine "Experiment" have been very satisfactory. During the time the engine was working the Irish mail from Crewe to London, and the limited Scotch mail from London to Crewe, the average consumption per train mile was 26.6 lbs. of coal, compared with 34.6 lbs., the average consumption of the standard four-coupled passenger engines with 17 in. cylinders and 24 in. stroke, the boilers being precisely the same in each case. One of the principal features in the new engines has been the adoption of a boiler with the water-space of the fire-box carried under the grate, the space between it and the fire-bars forming the ashpan, just as was done in the case of the 18 in. goods engine which was fully described at the meeting of the Institution at Barrow. The object is to do away with the rigid foundation ring, which is always a source of trouble; to obtain better circulation for the water; and to prevent the lodgment of dirt on the sides of the fire-box where subject to the most intense heat. A flanged mouthpiece, similar to that of the fire-box, is formed in the centre of the water-space, and covered with sliding doors worked from the foot-plate, so that the ashes can be easily removed or dropped; while any sediment that may collect in the water-space can



STANDARD PASSENGER LOCOMOTIVE.

readily be removed through the wash-out plugs in the sides of the fire-box, there being a clear passage from side to side when the covers are taken off. The mouth of the ash-pan is made of such a width that the tube-plate can be taken out and replaced by a new one, without disturbing the other parts of the fire-box. The principal features of the compound engine having thus been described, there are one or two other points to which a reference may be interesting. The leading axle is placed immediately under the large cylinder, and nearly in a line with the centre of the chimney; consequently the wheel base is longer than usual, the distance from leading to front driving wheels being 9 ft. 4 in., and from front driving to trailing wheels 8ft 3 in., making a total wheel base of 17 ft. 7 in. To overcome the disadvantage attached to a long, rigid wheel-base, the leading axle is provided with a radial box having a lateral movement of 1¼ in. to each side of the centre line. The box is formed in a single casting, with the brasses fitted in each end, and works between curved plate-guides, stretched across from frame to frame. Inside the box and under the axle are carried two horizontal helical springs, coiled right and left hand, and working one inside the other, so that, when the engine enters a curve, the springs are compressed toward one side, and take any shock that may be transmitted through the wheels from the rails; and when the engine gets on to the straight again, the springs resume their normal position, and keep the engine central. This class of axle-box, but with two sets of side controlling springs,* has now been in use seven years with very good results, and 155 engines are fitted with it, 40 of them having one at each end. The journals of the axles, it will be seen, are long in each case. Those of the leading axle are 10 in. long and 6 in. diameter, while those of the front driving-axle are 13½ in. long and 7 in. diameter, with crank journal 5½ in. long and 7¾ in. diameter; and the trailing-axle journals are 9 in. long and 7 in. diameter. The advantage of these long journals has been amply proved in the running of the "Experiment." The engine, although still working on the London section, has been taken off the Irish and Scotch mail trains, because it was not fitted with the gear for working the vacuum brake with which these trains are now provided, and it was not thought advisable to bring the engine into the shops for the present in order to apply the vacuum brake gear. The new engines, however, are fitted with ejectors and all the necessary gear for working the vacuum brake; and in addition with a steam brake, acting between the two pairs of driving wheels. This is also coupled to the tender brake gear, so that the brake is applied to the engine and tender at the same time. A single movement of the driver's brake-handle serves to apply both the vacuum and the steam brake simultaneously; and similarly to release them together. Appended is a statement of the leading dimensions, etc., of these engines:

Three-Cylinder Compound Express Passenger Locomotive.

Cylinders:		
Two high-pressure outside cylinders	} Diameter,	13 in.
	} Stroke,	24 in.
One low-pressure inside cylinder	} Diameter,	26 in.
	} stroke,	24 in.
Joy's valve motion.		
Wheels:	ft.	in.
Diameter of leading wheels, with radial axle-box	3	6
Diameter of front driving wheels (low-pressure cylinder)	6	6
Diameter of hind driving wheels (high pressure cylinders)	6	6
Distance between leading and front driving wheels	9	4
Distance between front driving and hind driving wheels	8	3
Total wheel base	17	7
Boiler:		
Length of barrel	9	10
Mean diameter of barrel, outside	4	1 3-16
Length of fire-box, inside	4 ft. 9⅛ in. at top	4 10½ at bottom.
Width of fire-box, inside	3	5½
Height of fire-box from top of fire-bars to crown	5	5½
Length of tubes between tube plates	10	1
Diameter of tubes, outside	0	1⅞
Number of tubes	198	
Heating surface:		
Fire-box	103.5 square feet.	
Tubes	980 "	
Total	1083.5 "	
Area of fire-grate	17.1 square feet.	
Ratio of heating surface to grate area = 63.35 to 1.		
Weight:		
Weight of engine when empty	34.75 tons.	
Weight of engine when in working order—		
Leading wheels 10.40 tons		
Front driving wheels 14.20 tons		
Hind driving wheels 13.15 tons		
Total	57.75 tons.	

In closing this paper the writer wishes to add that his motive in laying before the members of the Institution the particulars of his system of compounding locomotives is to draw attention to the subject, and encourage its full investigation, as he feels assured that better economical results are to be obtained than those which he has already found.

* The single set of springs is a great improvement, as there is otherwise a possibility of side action, in case one set of springs breaks or is weaker than the other.

DISCUSSION.

The discussion on Mr. Webb's paper was opened by the reading of a letter from M. A. Mallet, of Paris, who stated that he was unable to be present at the meeting.

M. MALLET said he had for some time advocated the application of the compound system to locomotives, but that he preferred an arrangement with one pair of cylinders only, instead of two sets of cylinders, as employed by Mr. Webb. In designing his own compound locomotive he had endeavored to keep the engine as like an ordinary locomotive as possible, and he maintained that the arrangement he proposed was quite adapted for high speeds. M. Mallet also referred to the design for a three-cylinder compound engine proposed by M. Jules Morandiere. This design he considered to be to some extent in anticipation of Mr. Webb's design.

Mr. WILLIAM RICH, who was the first speaker, said he was glad to find the subject of compound locomotives was being brought before the Institution. He believed that it would not be long before a number of such engines were running in this country. Some two years ago he had prepared for the Royal Agricultural Society a report on the application of the compound system to traction and ploughing engines, and he had been able to show the great advantages attending the use of the system in such cases. He believed that compound traction engines could do fully one-third more work than the simple engines with the same amount of fuel and water. If in locomotives a similar gain could be insured, it would be an advantage, not only to railway companies, but to the public, and it would enable fuel to be carried for longer runs. He was surprised to notice in Mr. Webb's engine that the capacity of the low-pressure cylinder was only twice that of the high-pressure cylinder. He should have expected a larger ratio would have been preferable; inasmuch also as the low-pressure cylinder was not steam-jacketed he should rather have expected an accumulation of water in it. With regard to the effect of the compound system being to cause the blast to only act twice during each revolution of the driving wheels, instead of four times, he believed that the intermittent blast had a more effective action on the fire than the more frequent smaller discharges. He was also somewhat surprised at the character of the exhaust line in the high-pressure cylinder diagram exhibited by Mr. Webb. He should not have expected it to be so level. In conclusion, he stated he believed it would be an advantage to steam-jacket the low-pressure cylinder.

Mr. GOTTSCHALK, who spoke next, stated that he was a believer in the compound system, and he considered that Mr. Webb had made a decided advance in designing the engine he had described. A considerable advantage was the saving which might be expected in wear and tear. On the Semmering Railway, with which he was connected, it was necessary, in consequence of the steep gradients, to employ eight-coupled engines, and there was considerable difficulty in enabling these engines to traverse sharp curves without excessive wear and tear. By the adoption of Mr. Webb's system it would be possible to divide the wheels of these engines into two groups, one pair of axles being worked by the high-pressure cylinders, and the other pair by the low-pressure cylinder. Such an arrangement would tend to greatly reduce the wear and tear of both engines and rails.

Mr. T. R. CRAMPTON said he was much opposed to a multiplication of parts, and for that reason he objected to the compound system. Up to the present the working of Mr Webb's engine had only been compared with an ordinary locomotive, but this was hardly a fair comparison, as the cubic capacity of the cylinders of the compound engine was greatly in excess of that of the cylinders of the ordinary engine with which the comparison had been made. If the comparison had been made with an ordinary engine having the same capacity of cylinder, and hence more room for expansion, the results would probably have been different. The removal of coupling rods which had been effected by Mr. Webb he believed to be a good thing. In fact, he might state that he had once gone so far as to make an engine with four wheels, each driven by a separate cylinder in order to avoid coupling.

Mr. BORODIN, of South Russia, considered that in dealing with heavy freight trains with a compound engine such as Mr. Webb proposed, there might be some difficulty owing to the fact of the low-pressure piston exerting no tractive power with the crank in certain positions. This would cause difficulty in starting trains. His own experiments on the compound locomotive on M. Mallet's system had shown that the maximum saving possible, as compared with the simple engine, was 18 per cent. under certain circumstances, and he considered that the saving described by Mr. Webb in his paper was too high. The results recorded might probably have been due to better management in the case of the compound engine. He believed that it would be very probable that the compound system would be largely applied to locomotives. It had been said that existing locomotives were very perfect, but M. Marie, of the Paris & Lyons Railway, had shown by the recent experiments that the consumption of steam per horse-power for such engines is about 12 kilogrammes, whereas the compound engine would work with a consumption of 10½ kilogrammes per horse-power per hour. On the other hand, condensing engines might easily be made to consume but 8½ kilogrammes per indicated horse-power per hour, and what was really wanted was a practical condensing locomotive.

Mr. DAVID JOY said that he had had frequent opportunities of examining Mr. Webb's engine, and he could fully corroborate the results obtained. The engine ran very freely on curves, and he regarded the doing away with the coupling rods as a very important matter. He might mention that Mr. Webb's first compound locomotive, the "Experiment" had been worked by two sets of drivers, and this of course was a di-advantage. He (Mr. Joy) had been asked to design locomotive engines for South America, in which a special point was to save water. The engines had to do their main work on a heavy rising gradient with no water on the top, all the water having to be carried to the plateau by the trains. Under such conditions he believed the compound system would be very advantageous.

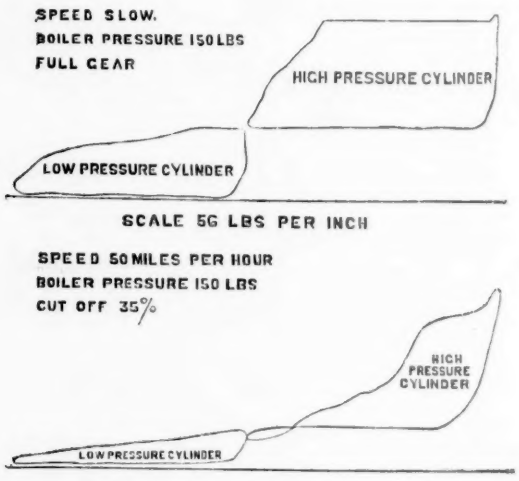
M JULES MORANDIERE remarked that as his name had been mentioned in M. Mallet's letter, he thought it only right to state that the three-cylinder engine designed by him had never been worked out in detail, and he, therefore, could not consider it in any way an anticipation of Mr. Webb's design. It may be pointed out also that the engine in question had a single high-pressure and two low pressure cylinders, so that it did not possess the advantages for starting which Mr. Webb's design affords.

Mr. DRUITT HALPIN said he thought Mr. Webb had not given himself sufficient credit for all the advantages he had obtained with his locomotive. A very important point was the manner in which the strains were reduced. As regarded the radial axle-boxes used by Mr. Webb, he (Mr. Halpin) had used them on engines having to traverse very sharp curves, and they had proved most successful. He believed that it would be most desirable to steam-jacket the low-pressure cylinder of Mr. Webb's compound engine, but, of course, the steam on its way to this cylinder was partially superheated by having to pass through the pipes in the smoke-box. This, to some extent, served the purpose of the steam jacket, but the superheating was not controllable. The effect of steam jackets had recently been very plainly shown by experiments made in the neighborhood of Liége. These experiments were made on an engine which did not fulfill the terms of the contract under which it was put up. It was found that the bad performance was due to the jackets not acting properly, the steam traps being defective. On the steam traps being put right, 17 per cent. of the whole weight of water used was condensed in the jackets, and the consumption of steam was reduced 50 per cent., as compared with the engine working without the steam jackets in use. The engine in this case was working with a very light load. He considered it would be of much interest if Mr. Webb could give the water consumption per horse-power of his compound engine. The economy obtained by the engine was divisible into two parts, and might be considered to be partly due to the economy effected by expanding the steam in two cylinders and partly to the fact that in the compound engine the boiler had to evaporate less water per hour per square foot of surface.

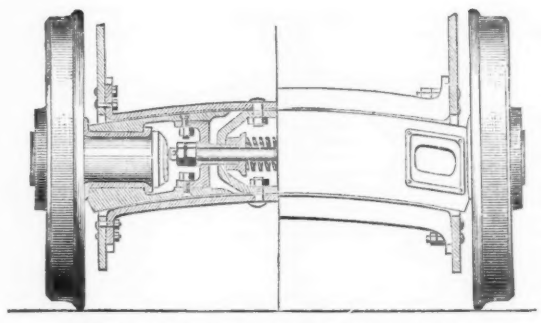
Mr. MCDONNELL observed that very few railways could afford to try experiments of the kind described in Mr. Webb's paper, and he considered that the members of the Institution ought to be greatly obliged to Mr. Webb for bringing the results of his experience before them. He (Mr. McDonnell) did not consider that the removal of coupling rods was a very important matter. If properly made, very few coupling rods broke. He, however, considered that Mr. Webb's engine was a great success, and he expected that railway engineers would show their appreciation of it by copying Mr. Webb's plans.

Mr. W. STROUDLEY also considered that railway engineers owed Mr. Webb their thanks for the manner in which he had gone into the question of compound locomotives, and brought his experience before them. The economy of the compound system was, he considered, thoroughly established. It was undoubtedly very good for passenger engines, but he considered that it would give still more favorable results if applied to goods engines. A passenger engine running at a high speed was in a far better condition for using steam economically in a single cylinder than a goods engine running at a slow speed, and he therefore anticipated that Mr. Webb would get far better economical results as compared with the ordinary locomotive, if he applied his system to goods engines. The figures given in Mr. Webb's paper did not, he considered, show any very great economy in fuel for the compound engine. On the London, Brighton & South Coast Railway the average consumption per mile for all the engines during the past half-year had been 25 lbs. only.

Mr. WEBB, in reply to the discussion, stated that since the paper had been prepared he had turned out 10 more compound locomotives, and he had excellent results with them. He had found no signs of any condensation in the large cylinder, and no signs of priming. The spaces between the large cylinder and the plates surrounding it were packed with silicate cotton. With regard to the complication he might mention that in the compound engine he had only three connecting rods, as compared with two connecting rods and two coupling rods in the ordinary locomotive. He had often on former occasions heard Mr. Crampton's views, but he could not agree with them. Mr.



Diagrams from Compound Locomotive



Radial Axle Box for Compound Locomotive.

Crampton wished not only to use one cylinder but one pair of wheels, and in his (Mr. Crampton's) engine he placed these wheels so that not more than half the weight of the engine could be utilized for adhesion. He might add that it was while examining one of Mr. Crampton's engines that the idea of driving two groups of wheels by cylinders arranged on the compound system suggested itself to him, his idea being to utilize a greater part of the weight of the engine. In conclusion, he mentioned that when the first compound engine was brought out it performed a christening trip of 528 miles. It was run first from Liverpool to London, and being then found all right it was hooked on to the Holyhead mail and run from London to Holyhead. Being still all right it was then attached to the return train and ran back from Holyhead to London. He (Mr. Webb) was now engaged in constructing an engine on the compound system for working the London & Northwestern trains on the Underground Railway, the change being made by altering one of the original engines. With regard to coupling rods he found that with the trains running on the Metropolitan District Railway, he could only get five or six years out of the coupling rods before they showed signs of fracture.

The PRESIDENT, in proposing a vote of thanks (which was cordially passed) to Mr. Webb for his paper, remarked that they were accustomed to look to Crewe for something good, but in this case Mr. Webb had more than fulfilled any expectations they might have had.

Review of the Railroads of the United States in 1882.

[From the Introduction to Poor's Manual for 1883.]

With this number we present to the public the sixteenth annual number of the Manual of the Railroads of the United States. The accompanying statements show a mileage at the close of 1882 of 113,329 miles, 11,591 having been constructed within the year. The average mileage operated for the year was 107,158. The amount of share capital issued by the several companies up to the close of their respective fiscal years was $3,456,078,196, an increase from the previous year of $385,254,585. The funded debts of the several companies amounted to $3,184,415,201, an increase from the previous year of $352,554,496. Their floating or unfunded debts amounted to $255,170,962, an increase of $42,404,965 from the previous year. The total increase of share capital and of funded and floating debts from the previous year equaled $780,213,776. The total amount of all liabilities at the close of 1882 was $6,895,664,359. The total per mile for completed mileage was $61,342. The total of stocks and liabilities for 1881 was $6,115,540,583; the amount per mile, $57,730; the total for 1880 was $5,373,015,928; per mile, $58,949; the total for 1879 was $4,872,017,517; per mile, $57,730.

The gross earnings of all the roads for their several fiscal years of 1882 were $770,356,716, an increase from the previous year of $67,066,511.

Of the gross receipts, $202,140,775 were received from passengers, $506,367,247 from freight, and $61,848,734 from miscellaneous sources. The net earnings for the year were $310,682,877, an increase of $24,929,109 from the previous year. The amount of interest paid was $149,295,380, an increase of $20,708,078 from the previous year. The amount of dividends paid was $102,031,434, an increase of $9,687,244 from the previous year. The percentage in 1882 of gross earnings to investment was 11.2 per cent; in 1881, 11.5; in 1880, 11.4; in 1879, 10.8. The percentage of net earnings to investment in 1882 was 4.5 per cent.; in 1881, 4.7; in 1880, 5.1; and in 1879, 4.4 per cent. The earnings per mile of all the railroads operated for 1882 were, gross, $7,188; net, $2,899; in 1881, gross, $7,527; net, 3,040; in 1880, gross, $7,435; net, $3,293; in 1879, gross, $6,652; net, $2,761.

The accompany statement (see table) is an abridgment of the much more extended one, embracing in detail all the railroads of the country. It shows that since 1879, a period of three years, there have been opened in the United States 28,019 miles of railroad, and that 10,463 miles were opened the past year up to the close of the fiscal years of the several companies. The extent actually opened during the calendar year was 11,591 miles. It is probable that the mileage given in the previous numbers of the Manual was somewhat in excess of its actual extent in consequence of duplications by the companies themselves, they often treating leased lines as their own. The amount of earnings given in the Manual for 1881 were undoubtedly too large, from the duplication by railroad companies of the earnings of leased lines, and from an error of $10,000,000, discovered in revising the addition of the tables of the Western states for that year. The amount now given may be regarded as correct. For the purpose of getting the exact extent of mileage constructed in the past year, and the total extent of mileage in the United States, we addressed circulars to every company. Answers to these were received in nearly every instance, so that the present statement of mileage constructed in 1882, and previous thereto, may be regarded as absolutely correct.

The increase of share capital and indebtedness of the railroad companies for the three years ending Dec. 31, 1882, was $2,023,646,842, the average cost per mile of the new mileage being, in round numbers, $70,000. The increase in the three years of the funded debts of the several companies has been $864,926,029; of their floating debts, $98,289,910; the two sums amounting to $963,215,939, a sum equaling something over $30,000 per mile of line. The cash cost of all the railroads constructed in the United States in the last three years did not exceed, probably, $30,000 to the mile, or $900,000,000 in all. To this sum is to be added at least $150,000,000, derived chiefly from earnings, expended in improvements of old lines. It is safe to estimate that the actual cash expenditure upon all the railroads of the United States within the past three years did not exceed $1,050,000,000, a sum $973,646,842 less than the increase, in the period named, of capital and indebtedness of the several companies. Of course such an enormous increase of liabilities over cash outlay is to be greatly regretted, and is well calculated to create a distrust of all securities, good and bad. In most of the states the general railroad laws forbid the issue of share capital unless its full equivalent is paid; but these are avoided by contracts by which a certain amount of stock and bonds are issued in full payment for the construction of a given number of miles. In all states, probably, statutes against usury cannot be pleaded in avoidance of railroad bonds. They can, consequently, be issued and sold in any amounts and at any price, the only limit being the refusal of the public to take them. Taught by the disasters of the past, we are probably entering upon a more healthy period in railroad construction. It is now seen that in such states as Ohio, and even in the state of New York, no extent of additional mileage which has not for its object the development of a particular interest—coal, for example, which is fast supplanting wood as a fuel—will add materially to the amount of earnings in such states, the existing mileage in such supplying all the means and facilities wanted. In such states, consequently, with the reservations made, no new mileage of any considerable extent can be constructed at an advantage at all compensating for the unproductive outlay. The same may be said of new lines built nominally to serve as carriers between the West and the East. The existing lines are capable of transporting twice or thrice the tonnage now offering, or that is likely to offer itself. The result of all such new lines will be to divide business with, and thus weaken, the old; or, unable to compete, their stocks and bonds must remain comparatively valueless. Their want of success will serve to check the further construction of all undertakings of the kind. Indeed the uncertainty which prevails as to the value of the enormous mass of stocks and bonds which has been put upon the market in the last three years is exerting a very salutary influence in checking or postponing new enterprises till the results of the past can be more clearly seen.

The construction of railroads in this country seems to proceed in great waves. In recurring periods it becomes the absorbing passion of our people. All this is very natural. No enterprise is so seductive as a railroad for the influence it exerts, the power it gives, and the hope of gain it offers. Every community, no matter how well supplied, eagerly welcomes a new line, for the money its cost brings it, and the promise it offers of lower rates of transportation. When there has been a considerable pause in the construction of railroads, and the traffic of old lines, which, without rivals, keeps pace with the progress of the country, their success is predicated of every new line wherever situated, no matter how wanting in real merit it may be. In a highly excited state of the public mind the promoters of new enterprises have, for a time, everything their own way; for the argument on the other side can only be presented by the result itself. There never was a period in our history in which, in the construction and consolidation of railroads, the good sense of our people was so thoroughly at fault as in the period from 1879 up to and including 1882. There can be no doubt that the country is vastly richer and stronger than it was in 1873, and that there is no reason to apprehend the terrible disaster that followed that year; but confidence in our vast strength has probably led to excesses wholly disproportionate to our needs or means.

These remarks are to be received not as discouraging the construction of new lines into new territory, nor in the older states when called for in the development of mining industries capable of unlimited expansion, but to put an end to those purely speculative schemes the only object of which is the manufacture of securities for the purpose of imposing them upon the public. Attention should also be called to the enormous increase, for the same object, of stock and bonds of old companies, of which culpable examples might be given. While it is not probable that we shall ever again witness the construction, in a single year, of 11,500 miles of railroad, such construction will continue steadily and rapidly until our present mileage is doubled in extent. There are now, or soon will be, four great lines traversing the continent from ocean to ocean. These lines render every portion of it accessible, and will serve as trunks from which branch lines will radiate in every direction. Included in the available area of the United States are 3,000,000 square miles. A ratio of 1 mile of railroad to 10 square miles of area will give 300,000 miles of line. Construction will proceed uninterruptedly until such an extent of mileage is reached.

It is to the credit of the railway interest that, so far, there have been but very few defaults in the payment of the bonds of railroad companies. Their floating debts, though large in the aggregate, create no embarrassment. It is also a remarkable evidence of the wealth of the country that the expenditure of more than $1,000,000 for every day for three consecutive years—money almost wholly supplied by our own people—has created no strain in our money markets. This perhaps is not so much to be wondered at, as nations of the Old World, having much less wealth than our own, spend annually upon military and naval establishments—expenditures in one point of view wholly unproductive—sums greater than are expended annually in this country upon railroads. It is greatly in our favor that by far the greater extent of mileage constructed within the last three years has been in new territory, so that should the investment in them be wholly sunk the loss would be more than compensated by the advantage resulting from opening up vast tracts of fertile territory to settlement. The construction of railroads, no matter the scale on which, within the past three years, it has proceeded, is not likely to create anything like the widespread disaster that followed the breakdown of 1873, however much individuals may suffer. Many of the greater interests of the country are in a sound condition. There has been no undue speculations in real estate, that sure precursor of financial disaster. The embarrassments of railroads, whatever they may be, will be that of a single powerful interest, and will not, as they did in 1873, include every other in the country.

The number of passengers transported in 1882, on the railroads of the New England group of states, having a population of 3,990,529, was 65,220,934—a number 16.3 times greater than its whole population. The number transported in Massachusetts was 48,063,639, a number greater than for any other state. The number transported in the Middle group of states having a population of 12,196,876, was 205,844,626; or deducting 86,161,029 carried on the New York city elevated railroads, 119,683,597—a number very nearly equaling 10 times its population. The number transported in the Southern group of states, having a population of 12,255,910, was 10,875,511, a number 1,379,399 *less* than the population of this group. The number transported on the railroads of the Western and Southwestern group, having a population of 20,132,325, was 82,940,331—a number 4.1 times greater than its population; the lower average for this group arising from embracing in it the Southwestern states. The number transported on the Pacific group, having a population of 1,393,817, was 10,510,410—a number 7.5 times greater than its population. The total number transported on all the railroads of the United States the past year, not including the New York elevated roads, was 289,190,783—a number equaling very nearly 6 times the total population, 50,442,006, of the United States in 1880.

The number of passengers moved one mile in the New England group was 1,107,045,086, at a charge of 2.1 cents per mile; in the Middle States group 2,356,226,676, at a charge of 2.3 cents per mile; in the Southern group 559,577,836, at a charge of 2.6 cents per mile; in the Western group 2,708,268,037, at a charge of 3.2 cents per mile; in the Pacific group 351,942,279, at a charge of 3.1 cents per mile. The total movement on all the roads equaled 6,834,048,765 persons moved one mile, at a charge of 2.86 cents per passenger-mile.

The number of tons of freight transported on the part of the railroads of the New England group of states was 28,605,416 tons, being 7 tons per head of its population. The number of tons transported on the Middle group was 166,372,589, the number of tons moved per head of population being 13.6. The number of tons moved on the railroads of Pennsylvania, per head, was 23.4. The number of tons transported on the Southern group was 19,199,096, the number of tons per head being 1.56. The number of tons transported in the Western group was 140,791,848, being 7 tons per head. The number of tons transported on the Pacific group was 5,526,426, being 4 tons per head. The number transported on all the railroads of the United States, the past year, was 360,490,375 tons, the average tons moved per head of population being very little over 7 tons. The number of tons transported one mile on the railroads of New England group was 1,680,009,065, at a charge of 1.7 cents per ton per mile; on the Middle states group 14,232,884,685 tons, at a charge of 1 cent per ton per mile; on those of the Southern group 2,040,078,971 tons, at a charge of 1.8 cents per ton per mile; on those of the Western group 20,133,946,667 tons, at a charge of 1.2 cents per ton per mile; on those of the Pacific group 1,214,289,859, at a charge of 3.1 cents per ton per mile. The total movement on all the railroads of the United States for 1882 equaled 39,302,209,249 tons moved one mile, at an average charge of 1.2 cents per ton per mile.

While the tonnage of the railroads of the United States can be determined with sufficient accuracy, the value of this tonnage presents a much more difficult problem. The tonnage upon the Erie Canal, the great pioneer work of the country, is classified under the following heads: "Products of Forests," "Products of Animals," "Vegetable Food," "Other Agricultural Products," "Manufactures," "Merchandise," and "Other Articles." On the canal the value of each class is estimated by its officers or the shipper. So long as the canal was a large carrier of all classes of freight the average value of its tonnage was about fifty dollars. Its value is somewhat less now, the tonnage of the canal being confined to only a few articles. The railroads of New York are required to classify their freight according to the canal schedules, as will be seen in the statements for the New York Central and Erie railroads included herein. Following the canal valuation, and estimating the products of the forest at $20 per ton, the products of animals at $150 per ton, vegetable food at $40 per ton, other agricultural products at $40 per ton, manufactures at $25 per ton, merchandise at $250 per ton, and other articles at

Statement showing by groups of states the length of lines owned, share capital, funded debts, floating debts, length of lines operated, gross and net earnings and interest and dividends paid by all the railroad companies of the United States for their respective fiscal years of 1879, 1880, 1881 and 1882:

GROUPS.	Length of line owned.	Capital stock.	Funded debt.	Floating debt.
1879.	M.	$	$	$
New England Group..	5,910	186,869,222	127,026,763	16,269,956
Middle Group..	14,942	708,998,299	737,251,285	42,892,268
Southern Group..	12,978	204,600,039	248,061,428	17,771,003
Western Group..	46,102	1,146,8..8,767	1,047,561,016	68,427,206
Pacific..	4,461	148,340,906	159,588,680	11,520,619
Totals..	84,393	2,395,647,293	2,319,489,172	156,881,052
1880.				
New England Group..	6,027	186,442,230	130,662,802	13,950,157
Middle Group..	15,224	812,992,835	745,078,525	54,501,738
Southern Group..	13,938	237,198,143	282,579,151	17,381,957
Western Group..	50,481	1,243,749,071	1,180,385,356	70,498,276
Pacific Group..	5,477	212,605,576	188,841,280	7,157,861
Totals..	91,147	2,692,978,855	2,517,547,114	162,489,939
1881.				
New England Group..	6,118	193,515,606	132,044,980	16,662,422
Middle Group..	15,258	881,450,289	775,709,441	58,573,293
Southern Group..	16,754	239,012,751	375,349,723	23,734,987
Western Group..	56,925	1,531,634,159	1,351,502,261	100,456,353
Pacific Group..	6,296	225,209,806	197,194,300	13,339,912
Totals..	101,949	3,070,823,611	2,831,860,705	212,766,267
1882.				
New England Group..	6,233	197,071,108	139,232,591	17,493,569
Middle Group..	16,819	970,552,708	825,554,524	105,889,369
Southern Group..	17,429	363,379,347	410,593,656	22,084,875
Western Group..	65,078	1,635,310,332	1,595,255,387	83,518,056
Pacific Group..	6,862	289,764,701	213,779,043	26,185,093
Totals..	112,412	3,456,078,196	3,184,415,201	255,170,962

GROUPS.	Length of line oper'd.	Gross earnings.	Net earnings.	Interest paid.	Dividends paid.
1879.	M.	$	$	$	$
N. Eng'd Group.	5,068	40,767,408	14,383,957	5,492,690	7,236,205
Middle Group.	14,479	181,614,614	74,546,975	39,252,884	24,335,164
Southe'n Group	12,256	40,638,117	14,680,646	5,804,446	2,131,770
Western Group.	42,600	238,646,031	101,234,424	54,495,170	25,765,962
Pacific Group.	3,716	23,954,407	12,307,378	7,102,325	2,212,369
Totals..	79,009	525,640,577	217,153,380	112,237,515	61,681,470
1880.					
N. Eng'd Group.	5,846	47,552,011	15,855,979	5,746,369	7,999,191
Middle Group.	14,781	201,126,003	94,058,515	38,666,290	28,479,851
Southe'n Group	12,764	47,455,977	18,052,229	8,006,591	3,525,977
Western Group.	45,459	291,590,965	130,423,835	49,474,773	33,117,590
Pacific Group.	3,894	27,541,774	14,115,363	6,372,305	3,992,762
Totals..	82,744	615,266,730	272,545,921	107,866,328	77,115,371
1881.					
N. Eng'd Group.	5,999	51,253,109	15,295,007	6,129,371	8,393,030
Middle Group.	15,253	219,982,662	94,665,179	43,203,731	33,315,581
Southe'n Group.	14,374	63,376,223	23,208,759	11,146,877	3,593,259
Western Group.	52,216	332,671,505	133,419,182	59,844,556	40,254,829
Pacific Group.	5,216	36,006,652	19,165,641	8,162,767	7,787,491
Totals..	93,058	703,290,151	285,753,768	128,587,302	93,344,190
1882.					
N. Eng'd Group.	6,186	56,188,499	18,258,973	7,215,801	8,807,540
Middle Group.	19,569	232,450,765	96,330,189	41,242,496	36,847,270
Southe'n Group.	15,880	66,874,716	24,141,300	16,020,328	4,304,984
Western Group.	59,711	373,088,096	152,343,859	76,612,487	45,945,401
Pacific Group.	5,812	41,754,686	19,608,556	7,604,268	6,126,239
Totals..	107,158	770,356,762	310,682,877	149,295,380	102,031,434

$20 per ton, the value of the tonnage transported by the New York Central Railroad the last year was $725,000,000. At the average value of the tonnage transported by this road, $60 per ton, the aggregate value of all the tonnage transported on the railroads of the United States the past year was $22,011,533,760. A large amount of the tonnage of the railroads is twice or thrice reported by different and connecting lines. If we estimate these duplications to equal one-third of the whole, the value of the net tonnage transported by our railroads was, say, $15,000,000,000—equal to $300 per head of the population of the country. Railroad experts are the best fitted to form a correct estimate in such a matter as this, but it is not probable that our own is excessive: the probabilities are that it is below rather than above the mark.

The vast extent and variety of its productions, with railroads to give them easy access to the markets of the world, give full assurance that the commercial supremacy which the United States now enjoys among the nations is to be maintained. The enormous extent of our territory has the effect, in fact, to give uniformity of seasons and of crops; while such is their vigor and versatility that a year or two, at most, suffices to correct the mistakes that may be committed, and restore to them a prosperity which is the law, not the exception.

THE SCRAP HEAP.

The Fastest Train in England.

As there has been some dispute as to which is the fastest train in England, a contributor to the *English Mechanic* has sent to that paper the following tabular statement of the speed of the two fastest trains on British railroads:

"In a short note of last week's issue of the *English Mechanic* it is stated that the quickest railway run is made by the new Manchester-London express, between Sheffield and Grantham. That this is incorrect the following table will show:

DOWN.

Railway.	Run.	Miles.	Minutes.	Aver. speed, Miles per hour.
Great Northern	King's Cross to Grantham	105	126	50
Manchester, Sheffield & Lincolnshire	Grantham to Sheffield	56½	74	45½
Manchester, Sheffield & Lincolnshire	Sheffield to Manchester	41½	61	40¾

UP.

Railway.	Run.	Miles.	Minutes.	Aver. speed, Miles per hour.
Manchester, Sheffield & Lincolnshire	Manchester to Sheffield	41½	62	40¼
Manchester, Sheffield & Lincolnshire	Sheffield to Grantham	56½	74	45½
Great Northern	Grantham to King's Cross	105	124	50¾

"The average speed of each, including stoppages, is about 45¼ miles per hour. It will be seen that the fastest run is by the Great Northern, from Grantham to London, which is 5¼ miles per hour quicker than that from Sheffield to Grantham, and the latter run is about 9 miles per hour less than stated last week. I may add that they are usually through Peterborough punctual."

The Steepest Gradients in England.

A correspondent of the *English Mechanic* gives the following data concerning the longest tunnels and the steepest gradients in his country: "The longest tunnels in England are three in number, parallel to and within a few yards of each other, passing through a range of hills called Standedge, between Diggle on the west side, and Marsden on the east, on the London & North-western Railway main line, Manchester to Leeds. The tunnels are one canal tunnel and one railway (single line) tunnels. The canal tunnel was commenced 1794 and finished 1811, is 3 miles 171 yards long, and cost £123,803. This tunnel is on the north side of the railway tunnels, the first of which was cut 1845 to 1848, and cost £201,608, and is 3 miles 60 yards long, and the last new railway tunnel is on the south side above tunnels, and is 3 miles 59 yards long, and cost about £120,000, was cut 1868 to 1870. The tunnels are so close to each other that most of the refuse from the railway tunnels was brought out by the canal tunnel. The gradient up Shap Bank from Tebay northward is about 1 in 60 (88 ft. per mile) for nearly five miles, the gradient varying slightly, being steepest near the summit. From Chapel-le-Frith to Dove Holes, London & Northwestern, Buxton line, is 1 in 58 for about 2½ miles, and a bank at Checkerbent, near Bolton, London & Northwestern, Bolton to Liverpool, London, etc., is 1 in 33 (160 ft. per mile) for about ½ of a mile. Bromsgrove, Midland, I do not know the gradient; but, from experience as a passenger over it frequently, I should think it about 1 in 80."

Another correspondent gives the last gradient as 1 in 37= a little over 142 ft. per mile.

In the Smoking Car.

"We have lots of funny scenes on our trains," said the conductor of the midnight train from New York to Washington, *via* Philadelphia. "One of the funniest things I ever heard of happened on this train last night. An old gentleman took his seat well forward in the smoker and, having lighted a fragrant Havana, leaned back in peaceful enjoyment and contemplation. But soon he was disturbed by a sickening odor from the other side of the car, where a young Irish railroader had taken his seat and was quietly puffing a black dudheen, that looked as though it had seen ten years' service. It was loaded, evidently with plug tobacco, and was hard to keep alight, as was shown by the lip smacking and constant puffing of the smoker. As I passed him the old gentleman stopped me and whispered: 'Can't you get that Irishman to stop smoking his horrible pipe?' I told him the smoking car was for smokers and that there was no regulations as to style of pipe used. Then he whispered: 'Won't you hand him this cigar? Maybe that will stop him.' I took the cigar—evidently a prime Cuban—and handed it to the Irishman, explaining that the gentleman opposite presented it to him. 'His honor is a gintleman,' said Pat, puffing away at his dhudeen, to keep it alight, and I'll smoke it on Sunday after dinner.' And then he went on peacefully puffing at his pipe. Finally the old gentleman moved into the rear of the car, to get away from the odor."
—*Philadelphia Times.*

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the present volume of the *Railroad Gazette*:

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Des Moines & Fort Dodge	302	Portland & Rochester	100
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Erie & Pittsburgh	495	Rochester & Pittsburgh	41
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Chicago & Northwestern.

At the close of its twenty-fourth fiscal year, May 31, 1883, this company operated 3,584.10 miles of road, the statement of mileage by divisions being as follows:

	Miles.
Wisconsin Division, Chicago to Ft. Howard, and branches	555.26
Galena Division, Chicago to Clinton, and branches	313.14
Iowa Division, Clinton to Council Bluffs, and branches	652.88
Northern Iowa Division, Tama to Elmore, and branches	368.93
Madison Division, Belvidere to Winona, and branches	467.47
Peninsula Division, Ft. Howard to Lake Angeline Mine, and branches	374.33
Winona & St. Peter Division, Winona to Watertown, and branches	448.48
Dakota Division, Minnesota line to Pierre, and branch	403.61
Total mileage worked	3,584.10

Of this mileage 2,783.17 miles are laid with steel, leaving 800.93 miles of main track still laid with iron rails.

Additions during the year were 305.88 miles, as noted more in detail below. The average mileage worked for the year was 3,464.70 miles, against 3,032.90 miles for the preceding year.

Of the total mileage 1,202.97 miles are owned by the company directly, 1,862.78 miles owned through the proprietary companies, and 518.35 miles are leased. Of the whole line 500.15 miles are in Illinois; 902.55 in Wisconsin; 307.50 in Michigan; 1,021.81 in Iowa; 414.00 in Minnesota; and 438.09 miles in Dakota.

The equipment at the close of the last two years was as follows:

	1883.	1882.	Inc. or Dec.
Locomotives	578	558	I. 20
Passenger cars, first class	244	206	I. 38
" " second class	39	29	I. 10
Parlor and dining cars	13	13	.. ...
Baggage, mail and express cars	128	117	I. 11
Total passenger train cars	424	365	I. 59
Box cars	10,143	10,140	I. 3
Stock cars	1,435	1,436	D. 1
Platform and gondola cars	2,634	2,499	I. 135
Iron ore cars	3,857	3,857	.. ....
Caboose cars	282	244	I. 38
Total freight cars	18,371	18,176	I. 195
Paymasters' and officers' cars	5	4	I. 1
Boarding cars	18	18	.. ..
Pile-driving and wrecking cars	24	22	I. 2
Dump and ditching cars	65	65	.. ..
Total service cars	112	109	I. 3

The equipment per mile of road worked at the close of the year was 0.16 locomotive, 0.12 passenger-train car, 5.13 freight cars and 0.03 service car. The number of cars per locomotive was 0.73 passenger-train car, 31.78 freight cars and 0.19 service car.

The Land Department reports sales of 244,109.39 acres and 3,428 town lots for $1,205,546.43. The money received during the year from cash sales and advance payments on credit was $667,500.67; from deferred payments on credit sales, $235,437.42; from interest on deferred payments, $58,788.51, and from sales of stumpage and collections for trespass, $64,717.50. Total cash receipts from all sources, $1,026,444.10, an increase over the preceding year of $206,249.33.

At the close of the year there were 387,399.94 acres under contract, and the obligations held under these contracts amounted to $1,019,241.09. The company held 1,590,336 acres not sold or under contract, of which 784,532 were in Minnesota, 485,678 acres in Michigan, and 320,126 acres in Wisconsin. Collections have generally been good, and there were very few defaults in payment on contracts.

The Land Commissioner's report says: "The stagnation in the iron ore trade, and some temporary depression in the lumber business, have caused a falling off in the sale of timber lands. The pine and cedar lands have nearly all been disposed of, and the remaining lands in Michigan and Wisconsin being clothed with hard wood, will probably be somewhat slow of sale. They are, however, of great prospective value, and must eventually sell for fair prices.

"There has been a great increase in the emigration to Dakota. The lands in that great territory east of the Missouri River will soon be absorbed, and the company's lands in Southwestern Minnesota must rapidly appreciate in value. A comparison of the average price at which the lands of the Minnesota grant have sold during the last and preceding fiscal years, shows that the cheaper lands of the company having first been sold, those higher in price are now being taken without dimunution in the volume of sales. The settlement and improvement of adjacent lands will soon enhance the value of the inferior lands in this grant, so that the company may expect to realize as much for them as is now being asked for the lands of prime quality."

GENERAL ACCOUNT.

The general account at the close of the year was as follows:

Liabilities:

Capital Stocks:			
Common stock and scrip C. & N. W.	$16,851,255.97		
Less amount owned by Co	621,350.32		
		$16,229,915.65	
Preferred stock and scrip C. & N. W.	$22,324,454.56		
Less amount owned by Co	1,264.56		
		22,323,190.00	
		$38,553,105.65	
Chi., Milwaukee & Northwestern		8,690,000.00	
Consolidation Coal Co		200,000.00	
Dakota Central		250,000.00	
Elgin & State Line		1,080,900.00	
Iowa Midland		50,000.00	
Iowa Ry., Coal & Mfg. Co		60,000.00	
Iowa Southwestern		1,500,000.00	
Stanwood & Tipton		5,000.00	
Toledo & Northwestern		8,302,500.00	
Winona & St. Peter		2,300,000.00	
Western Town Lot Co		25,000.00	
			$61,016,505.65
Funded debt:			
Total bonded debt, including bonds in sinking funds			69,821,000.60
Bonds purchased with Winona & St. Peter land grant funds, and canceled			460,000.00
Sinking Funds Paid:			
On Madison Extension gold bonds		$138,000.00	
" Menominee " " "		120,000.00	
" General consolidated " "		1,024,000.00	
" N. W. Union " " "		105,000.00	
" W. & St. P. Ex. " " "		138,000.00	
			1,525,000.00
General Liabilities:			
General consolidated gold bonds unsold		284,000.00	
Notes of Consolidation Coal Co. for coal lands maturing in 1891		300,000.00	
			584,000.00
Current Liabilities:			
Material, fuel and steel rail bills for May		$1,043,022.88	
Current pay rolls		922,630.72	
Unpresented coupons, old dividends, etc		82,668.49	
Accrued interest, not yet due		675,395.00	
Dividends declared, not yet due		1,023,406.50	
Accrued rental of roads in Iowa, not yet due		530,363.93	
Balance due to sundry railroad companies		66,601.48	
			4,344,089.00
Income Balances:			
Land income accounts			1,033,564.88
Railroad income account, surplus			8,425,861.63
Total liabilities			$147,210,021.16

Assets:

Road and Equipment:		
Chicago & N. W. R.	$80,420,031.92	
Chicago, Milwaukee & Northwestern	18,141,779.39	
Consolidation Coal Co	374,888.64	
Dakota Central	5,597,470.13	
Elgin & State Line	1,080,900.00	
Iowa Midland	1,403,263.61	
Iowa Ry., Coal & Mfg. Co	61,937.18	
Iowa Southern	2,262,068.07	
Stanwood & Tipton	125,000.00	
Toledo & Northwestern	14,068,346.41	
Winona & St. Peter	12,481,364.45	
Western Town Lot Co	71,854.13	
		$136,088,903.93
Trustees of Sinking Fund:		
Farmers' Loan & Trust Co., Trustee	$501,000.00	
Union Trust Co., Trustee	1,024,000.00	
		1,525,000.00
General Assets:		
Consolidated sinking fund currency bonds on hand	$554,000.00	
General consolidated gold bonds on hand	284,000.00	
Northwestern Union first-mortgage bonds on hand	1,000.00	
Cost of securities of sundry proprietary companies	2,074,219.31	
Outside real estate in Chicago (taken on account of Chicago fire)	200,000.00	
		3,113,219.31
Current Assets:		
Materials and fuel on hand	$2,526,482.48	
Due from United States Government	73,162.82	
Due from express companies	11,445.67	
" agents and others, being earnings in course of collection	953,107.76	
Due on coal sales, Consolidation Coal Co	64,007.52	
Due from various persons	67,330.09	
Bills receivable	76,864.73	
Cash	2,710,496.85	
		6,482,897.92
Total assets		$147,210,021.16

The substance of his balance sheet, deducting items which appear on both sides above, and others which are chiefly matters of book-keeping, is given as follows:

Property:

Cost of road and equipment	$136,088,903.93
Cash on hand	2,710,496.85
Balance on sundry accounts	463,966.50
Total	$139,263,367.28

Represented by:

Common stock and scrip, C. & N. W. Ry	$16,229,915.65
Preferred stock and scrip, C. & N. W. Ry	22,323,190.00
Capital stock of proprietary roads	22,463,400.00
Funded debt	69,821,000.00
Income account	8,425,861.63
Total	$139,263,367.28

Changes in stock during the year were the issue of $118,500 preferred stock for conversion of Peninsula bonds

and $110 to retire old Galena & Chicago Union stock; the issue of $1,188,000 common stock for stock of Menominee River Co.; $432,000 for stock of Escanaba & Lake Superior Co.; $113,500 for conversion of Peninsula bonds and $110 to retire Galena & Chicago Union Stock; a total addition of $1,733,610 common and $113,610 preferred stock.

There were $235,000 old bonds of various issues canceled during the year. New issues of bonds were $2,100,000 sinking fund 5 per cent. bonds on 140 miles of new road; $765,000 Dakota Central 6 per cent. first-mortgage bonds; $1,000,000 Dakota Central (Southeastern Division) first-mortgage 6 per cent. bonds; $300,000 Chicago, Milwaukee & Northwestern 6 per cent. bonds; $143,000 consolidated bonds of 1917, issued for old bonds canceled; $1,500,000 debenture 5 per cent. bonds of 1933, being a part of the issue of $10,000,000 authorized for the purchase of the Chicago, St. Paul, Minneapolis & Omaha. The total amount of the new issues was $5,808,000, and the net increase in bonded debt was $5,573,000.

TRAFFIC.

The traffic for the year was as follows:

	1882-83.	1881-82.		Inc. or Dec.	P.c.
Pass. carried	7,968,560	6,754,717	I.	1,213,843	17.9
Pass.-miles	248,856,303	205,574,178	I.	43,282,125	21.1
Tons freight carried	7,874,665	8,190,893	D.	316,228	3.9
Ton-miles	1,183,829,358	1,192,188,039	D.	8,358,681	0.7
Av. receipt:					
Per pass.-mile	2.46 cts.	2 52 cts.	D.	0.06 ct.	2.4
Per ton-mile	1.42 "	1.47 "	D.	0.05 "	3.4

The average passenger journey was 31.23 miles; the average freight haul 150.33 miles.

There was a large increase in passenger traffic and a small decrease in freight traffic, accompanied by a small decrease in rates on all classes of business.

The train movement for the year was as follows:

Train miles:	1882-83.	1881-82		Inc. or Dec.	P.c.
Passenger	4,913,507	3 999,677	I.	913,830	22.9
Freight	9,770,415	9,003,377	I.	767,038	8.5
Service	1,284,816	0 245,601	I.	39,215	3.1
Switching	4,063,158	3,908,602	I.	154,556	3.9
Total	20,031,896	18,157,257	I.	1,874,639	10.3
Car miles:					
Passenger train	22,771,997	19 801 642	I.	2,970,355	15.0
Freight	187,411,933	194,547,302	D.	7,135,369	3.6
Av. train:					
Passenger cars.	4.46	5.23	D.	0.77	14.7
Freight cars	19.18	24.02	D.	4.84	20.2
Av. train load:					
Passengers, No.	50.65	54.67	D.	4.02	7.3
Freight, tons	121.16	147.21	D.	26.05	17.7

Locomotive service cost last year 21.68 cents per mile run, including all expenses. There was a decrease in freight car mileage and a noticeable diminution in the average train load, both passengers and freight, due probably to the increased mileage over new branches where the business is light.

The earnings per train mile were as follows:

	Passenger.	Freight.	All trains.
Receipts	$1.44	$1.74	$1.64
Cost	0.68	1.10	0.96
Net earnings	$0.76	$0.64	$0.68

This result shows a decrease in gross receipts per train mile of 18 per cent., and in net earnings of 36.8 per cent. from the previous year.

EARNINGS.

The earnings for the year were as follows:

	1882-83.	1881-82.		Inc. or Dec.	P.c.
Freight	$16,894,352	$17,525.134	D.	$630,782	3.6
Passengers	6,119,616	5.171,423	I.	948.193	18.3
Mail and express	832.750	793.132	I.	39,618	5.0
Miscellaneous	235.116	194,967	I.	40,149	20.6
Total	$24,081,834	$23,684,656	I.	$397,178	1.7
Expenses	14,072.516	12,639,634	I.	1,432,882	11.3
Net earnings	$10,009,318	$11.045,022	D.	$1.035,704	9.4
Gross earn. per mile	6,951	7,809	D.	858	11 0
Net " "	2,880	3,642	D.	753	20.7
Per cent. of exps	58.44	53.37	I.	5.07	....

Taxes are included in the expenses above, amounting to $618,785 last year, against $522,558 in the preceeding year.

The earnings as given more in detail were as follows:

	Amount.	Per cent. of total.
First-class passengers	$3,802,737 56	15.79
Second-class passengers	885,132.87	3.68
Excursion passengers	1,063,068.73	4.42
Commutation passengers	352,274.79	1.46
Parlor cars	16,401.80	.07
Freight	16,749,055.51	69.55
Transportation of milk	145.296.24	.60
Express matter	411,6 0.19	1.71
United States mail	421.150.44	1.75
Extra baggage	48,091.75	.19
Miscellaneous	187,024.44	.78
Total	$24,081,834.32	100.00

Included in the cost of track renewals and repairs for the year are 11,155 tons of steel rails, 40 tons re-rolled iron rails, and the quantity of 36,362 iron and steel rails repaired and relaid in the track; the number of cross-ties used was 758,244; number of standard splice-bars, 92,038; of angle bars, 133,115; of nut locks, 380,957; kegs of spikes, 6,421; kegs of track-bolts, 2,695, and 111 switches. The expenditure for these items amounted to $1,325,816, including the sum of $242,227 for ballasting track, raising grades, and enlarging and deepening ditches. The whole sum expended for maintenance and charged to operating for materials and labor upon track, bridges roadway, road-fences, crossings, etc., for the year was $3,952,348.

The amount of track on the old and new lines laid with steel, on May 31, 1883, was 2,783.17 miles, or 77.65 per cent of the whole. The increase in steel track during the year was 375.45 miles.

The usual improvements in road, bridges and buildings were made during the year, including extensive renewals and repairs of bridges and a number of new buildings.

The report says: "An examination of the traffic shows that the gross gain of $397,178 was made from the Madison, Winona and St. Peter, Dakota and Northern Iowa divisions, whose aggregate increase over the previous year was $1,515,419; against this amount there was a comparative decrease in the aggregate earnings of the Wisconsin, Peninsula, Galena and Iowa divisions of $1,118,241; the difference constituting the gain in total gross earnings. The relative productiveness of the latter lines was no doubt affected by the light corn crops of the last two years, by diminished iron-ore transportation and rates, and by general business causes.

"The favorable increase shown on the new roads in Dakota, and the main lines leading thereto, and on the Northern Iowa Division, is largely the result of active settlement and development of the cheap lands of the Northwest.

"The increase in operating expenses was spread over nearly every item, and was occasioned by the greater mileage of railroad operated, by unusual severity of the winter on some of the lines, by greater cost and consumption of fuel, and generally by the increased service for the year.

"The item of taxes shows an increase of $96,227, or 18.41 per cent.—an additional burden imposed by public authority, but not justified by the results of the year."

The following table shows the average mileage worked and the earnings per mile, etc., for six years past:

	Miles operated.	Earnings per mile.	Per cent. of expenses and taxes.	Net earnings per mile.
1878	2,036.98	$7,241.63	51.66	$3,500.33
1879	2,149.37	6,847.53	58.86	3,227.84
1880	2,215.83	7,820.73	48.60	4,024.56
1881	2,644.16	7,311.99	53.92	3,369.03
1882	3,032.90	7,809.24	53.37	3,641.73
1883	3,464.70	6,950.63	58.44	2,888.94

The average mileage worked last year showed an increase of 70.1 per cent. over 1878. The gross earnings per mile were smaller than those of any year in the six except 1879, while the net earnings per mile were the smallest reported for the six years. As noted above, this is due to the large mileage of new road with light earnings.

The income account, condensed, is as follows:

Net earnings, as above		$10,009,317.96
Interest on bonds	$4,288,633.05	
Rental of leased roads	1,570.948.27	
Sinking fund accounts	98,120.00	
		5,957,701.32
Net income for the year		$4,051,616.64
Dividends paid		2,890,336 52
Surplus for the year		$1,161,280.12
Balance, May 31, 1882		7,564,581.51
Balance of income account, May 31, 1883		$8,425.561.63

The dividends paid were 8 per cent. on preferred stock in four quarterly payments, and 7 per cent. on common stock in two half-yearly payments.

The report gives the following summary of the financial operations of the year, presenting them in a very condensed form:

Resources of the year.

Gross earnings	$24,081,834.32
Increase in capital stock	1,427,470.00
Increase in funded debt	5,573,000.00
Balance from land grants	344.030.60
Total	$31.426,334.92

Disbursements.

Operating expenses, taxes, interest, sinking funds, rentals and dividends	$22,920,554.20
Expended for construction	4,669,833 11
Land notes matured and paid	104,774.10
Increase in supplies	235.142.0
Increase in cash	949,888.83
Increase in sundry assets	2,460,443.40
Decrease in unfunded debt	85,699.26
Total	$31,426,334.92

This, it will be seen, includes the receipts from issues of new securities, etc., as well as from the operations of the road.

CONSTRUCTION.

The report of President Albert Keep says: "The increasing business of the company, extending over a wide extent of country, has required additional facilities for the storage and movement of trains, and for local and terminal facilities The large amount of 67.28 miles of additional side tracks were constructed during the year, at an expense of $442,538.63; the obtaining of right of way and enlarged yard facilities cost $86,191.96; new station buildings, depots, shops, engine houses, coal houses, water stations, stock yards and miscellaneous structures amounted to $204,523.15; the sum of $24,809.47 was spent on the second main track between Clybourn Place and Evanston; $11,449.47 on West Chicago shops; $4,166.66 paid for account of Union Elevator at Council Bluffs; $105,759.77 for construction of fences, road-crossings, signs and yards; $227,612.89 for construction of permanent bridges, culverts and masonry; $96,535.28 for grading, ballasting and ditching new work, and the further sum of $96,171.39 for engine and car service, engineering, telegraph lines, and for other sundry items of construction, all of which amounted, in the aggregate, to $1,299,758.67.

"Besides this class of construction expenditures, there was paid the further sum of $3,560,295.48 for account of construction, as follows:

Extension of Menominee River road from Florence	$519,984.75
Escanaba & Lake Superior road	295.977.80
Extension of Aurora Branch	95,372.23
Galesville & Mississippi road	47.161.01
Mineral Extension to Smith Mine	6.369.10
Des Moines & Minneapolis road	96,756.48
Toledo & Northwestern R'y	1,035.117.05
Dakota Central	1,079,939.02
Chicago, Milwaukee & Northwestern, widening gauge and construction	345.406.04
Consolidation Coal Co (the company's coal mines) and Western Town Lot Co	38,211.91

"There was also expended for new engines and cars $643,722.82, making the total sum $5,503,776.97, from which should be deducted $833,943.86 for premium on bonds and stocks sold and for sundry construction credits, leaving the sum of $4,669,833.11 as the net outlay for construction, equipment and new railroads during the year.

CONSOLIDATIONS.

"The consolidation of the Escanaba & Lake Superior and the Menominee River railroad companies of the state of Michigan with the Chicago & Northwestern Railway Co. was fully consummated at the adjourned meeting of the stockholders, held at Escanaba, Michigan, Sept. 14 last, and the common stock of this company was issued in exchange and payment for the entire capital stock of the two Michigan companies, amounting to 16,200 shares, in pursuance of the articles of consolidation, and as authorized by the stockholders at their annual meeting in June, 1882, and at the adjourned meeting. By this action all the proprietary lines in Michigan have become a part of the Chicago & Northwestern Railway.

"Two of the branch lines in Wisconsin—one of about 6 miles, extending from Janesville to Alton, built under the charter of the Rock River Railway Co., and one of about 6½ miles, extending from Trempealeau to Galesville, built by the Galesville & Mississippi Railroad Co., were transferred to the Chicago & Northwestern Railway Co., by purchase of their property and franchises as authorized under the statutes of the state, and approved at the annual meeting in June, 1883; these roads were two of the proprietary lines, and the consideration of transfer was the assumption of their bonds (which had already been guaranteed at the rate of $15,000 per mile) and of their nominal liabilities, representing the first cost of the properties, by the Chicago & Northwestern Co. No capital stock was issued in the absorption of these branches.

"The requisite steps were taken to also consolidate the Elgin & State Line Co. and the Chicago, Milwaukee & Northwestern Co. with the Chicago & Northwestern Co., by notice to this effect in the call of the last annual meeting of the stockholders, which was held at Chicago, June 7, 1883, and by notice of a special meeting held at Menominee, Michigan, June 8, following; these two important lines constituted the remainder of the proprietary roads in Wisconsin, with a small portion thereof extending into Illinois. Although no further progress could be made within the fiscal year covered by this report, yet, inasmuch as the completion of this consolidation is of recent date, and has since transpired, it is deemed of importance to state that the necessary action was had at the annual meeting in June last in Illinois, and at an adjourned meeting of the stockholders on the same day at Milwaukee, Wisconsin, and at the special meeting at Menominee, Michigan, on June 8, 1883, and the consolidation was fully effected in accordance with the plan proposed. The amount of common stock of the Chicago & Northwestern Co. which has been issued pursuant to the agreement of consolidation in exchange and payment for the capital stocks of these two companies is 97,651 shares, all of which is now in possession and is the property of the company; but, it having been issued subsequent to writing up the accounts of the last fiscal year, does not appear as capital stock outstanding in the condensed balance sheet of this report.

THE OMAHA PURCHASE.

"In the month of November last, purchase was made of a majority of the capital stock, common and preferred, of the Chicago, St. Paul, Minneapolis & Omaha Railway Co., under arrangements for the delivery of the stock and payment therefor during the present summer, and the management of that company was reorganized and placed under the control of the Chicago & Northwestern Co. on Dec. 16 last. The purchase consisted of 93,200 shares of common stock, at the average price of 48.40 and 53,800 shares of preferred stock, at the average price of 104.04, and the cost, including interest up to the date of delivery, was $10,503,959.90. Provision was made for the payment of the greater portion of this amount by the issue of $10,000,000 of 5 per cent., 50-year debenture bonds of the Chicago & Northwestern Co., all of which have since been sold, and $1,500,000 of them were delivered in the last fiscal year. The residue of the issue has been delivered since that period. The balance of the purchase money was derived from the sale of a part of the 16,200 shares of Chicago & Northwestern common stock received in consolidation of the two Michigan roads.

"This transaction having been completed since June last, and after the close of the fiscal year, does not appear in the condensed balance sheet appended to this report. The stock is now held as one of the assets of the company, and three quarterly dividends have been received on the preferred shares since the purchase.

"The system embraced in the Chicago, St. Paul, Minneapolis & Omaha Railway at the time of the purchase covered 1,147 miles of well equipped railroad, extending from Minneapolis and St. Paul southeast to a connection with this company's road at Elroy; northwardly to Bayfield and Superior City on Lake Superior; southwesterly to Sioux City, Eastern Nebraska, Omaha and the Union Pacific Railroad, and, by its southern connection at the Iowa state line, opened to the Toledo & Northwestern Railway and all the Iowa roads of this company direct communication for the interchanging transportation of grain, cattle, coal, lumber and other products of Iowa and Minnesota; the company had other extensions and branches, as well as valuable land grants attaching to its Wisconsin lines, whose future development in the lumber interest must afford a large accession to traffic. The property of the Chicago, St. Paul, Minneapolis & Omaha Co. was much improved and enlarged under its former management, and some of its lines had become indispensable, and others greatly necessary to the integrity and completeness of the Chicago & Northwestern Railway system in the Northwest.

"Through this channel flowed all the business of the Chicago & Northwestern from Chicago into the great centres of St. Paul and Minneapolis, and by it connections were secured with the Manitoba, the Northern Pacific and the Canadian Pacific lines; its northern branches penetrated the best timbered regions of Wisconsin, and reached out to Lake Superior, and its southwestern and southern extensions from Minneapolis gave to the productive wheat regions of the Winona & St. Peter and Dakota Central roads easy access, on short hauls, to the unrivaled markets and milling facilities of Minneapolis. The separation of these lines from their close and legitimate relations to the Chicago & Northwestern Railway system would work great injury and loss of revenue to both companies, and millions of capital would be required to replace facilities which are now enjoyed by each in the harmonious working of the two lines. It is believed that the control of the Chicago, St. Paul, Minneapolis & Omaha Railway secures advantages of great importance to the stockholders of the two companies, and is in the interest of public convenience, economy and sound corporate policy.

NEW ROADS BUILT.

"During the year the Toledo & Northwestern Railway was completed to a junction with the Des Moines & Minneapolis line, a distance of 1.75 miles, and to the Sioux River, at Caliope, (now Hawarden), 76.47 miles, where it connects with the Southeastern Division of the Dakota Central Railway; the latter line, which is now under construction, extends thence for 125 miles northwesterly through a good region in Southeastern Dakota to Iroquois, a station on the main route of the Dakota Central leading to Pierre, on the Missouri River, and will be completed during the season of 1883. This road has more than local importance in forming much-needed connections east and south, between the Dakota system and the Iowa lines of the Chicago & Northwestern and the Chicago, St. Paul, Minneapolis & Omaha.

"The extension of the Dakota Central Road from the termious of the Winona & St. Peter line at Watertown to Redfield, on the James River Valley line, 71 miles, was completed last fall; an extension of 5.47 miles was also made of the James River Valley line from Ordway to Columbia, and another extension of 30.55 miles was built up the valley of the Big Sioux River.

"In Michigan, the Menominee River Railroad extension from north of Florence was continued to Crystal Falls and the Iron River District, and to various mine openings, in all a distance of 39.79 miles; and the Escanaba & Lake Superior Branch and mine extensions were also completed for a distance of 43.30 miles.

"In Wisconsin, a short line of 6.71 miles was constructed from Trempealeau station northeasterly to the thriving town of Galesville, under the charter of the Galesville & Mississippi River Railroad Co.; and 75 miles of the narrow gauge portion of the Chicago, Milwaukee & Northwestern Railway, west and south of Montfort, to Galena, were changed to standard gauge road and laid with steel rails.

"In Iowa, an extension of the Maple River Railroad of 31.5 miles was built westward from Sac City into an excellent agricultural region, by the Maple River Railroad Co., and is operated under a favorable lease in connection with the older leased line of that company."

The total new road built was 306.54 miles, from which must be deducted 0.66 miles for corrections in distances, etc., on the older lines, making a net addition of 305.88 miles to the company's lines during the year.

RAILROAD GAZETTE

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S. WRIGHT DUNNING AND M. N. FORNEY.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE CHICAGO & NORTHWESTERN REPORT.

The Chicago & Northwestern Railway during its last fiscal year (ending with last May) worked an average of 3,465 miles of road, which is 432 miles (14¼ per cent.) more than in the previous year. The increase was wholly of new road, a little in the iron ore region of Michigan, about 68 miles in Iowa, all in the thinly settled northwestern part, and 80 miles in Dakota, being first opened last year, and the remainder of the increase being in the average length of similar roads which were completed during the previous year, but worked only part of it. The additional capital, mostly representing this new road, caused an increase of $290,554 in the interest and rentals paid, and this and other requirements of the service occasioned an increase of 20⅜ per cent. in the freight train mileage, and of no less than 30⅔ per cent. in the passenger-train mileage. The increase in passenger traffic was 21 per cent., but there was no increase in freight traffic, on the contrary a slight decrease (about ¾ per cent.), the average train-loads decreasing from 54⅜ to 50⅜ passengers and from 147 to 121 tons of freight. The average rates were slightly lower last year, 2.46 cents per passenger per mile instead of 2.52, and 1.42 cents per ton per mile, instead of 1.47. This resulted in an *increase* of $948,192 in passenger earnings and a *decrease* of $630,782 in freight earnings, while the total gross earnings increased $397,178, or 1⅜ per cent. Of course with an increase of 24 per cent. in train mileage expenses increased much more than this small gain in earnings. Actually they increased $1,336,655, or 11 per cent., notwithstanding a *decrease* from $1.02 to 92 cents in expenses per traffic train mile. With the increase in interest and taxes, we have the company's profit from working 3,465 miles last year $1,326,458 (24¾ per cent.) less than from working 3,033 miles in 1881–82, $1,079,133 (20 per cent.) less than from the 2,644 miles worked in 1880–81, and very nearly the same as from the 2,216 miles worked in 1879–80, when there was a gain over the previous year of $1,792,000 (78 per cent.) in their profits, with scarcely any increase of mileage. The mileage worked, traffic rates, gross and net earnings and working expenses, fixed charges and profits per share of stock for ten successive years are shown in the two tables below:

Year to May 31.	Miles worked.	Passenger miles.	Ton miles.	Rate per mile. Pass.	Ton.
1874	1,923	109,134,533	461,412,039	3.40	2.40
1875	1,990	116,779,137	454,550,357	3.00	2.12
1876	1,992	122,281,308	503,132,389	2.85	1 95
1877	1,993	116,902,435	485,557,900	2 89	1.86
1878	2,037	118,877,406	623,768,593	2.83	1.72
1879	2,129	116,068,482	681,878,311	2 79	1.56
1880	2,216	140,116,884	865,909,542	2.67	1.49
1881	2,644	164,333,508	980,522,774	2.53	1.47
1882	3,033	205,574,178	1,192,188,039	2.52	1.47
1883	3,465	248,856,203	1,183,829,358	2.46	1.42

Year to May 31.	Gross earnings.	Expenses.	Net earnings.	Fixed charges.	Profit per share.
1876	$14 013,732	$8,274,290	$5,739,442	$4,713.327	$2.81
1877	13,033,102	7,526,101	5,507,001	4,578,659	2.54
1878	14,761,063	7,620,946	7,130.117	4,665 640	6.75
1879	14,580,921	7,707,649	6,873,272	4,585,644	6.·7
1880	17,349,349	8,431,600	8,917,749	4,837,581	11.18
1881	19,344,072	10,425,821	8,908,251	5,130,749	10.28
1882	23,684,656	12,639,634	11,045,022	5,666,947	14 44
1883	24,081,834	14,072,516	10,009,318	5,957,701	10.34

Thus the rapid growth in freight traffic and earnings since 1879 was interrupted last year, but the growth of passenger traffic, expenses and fixed charges kept on.

So far as freight traffic is concerned, the failure of the corn crop on the company's lines for two successive years, felt but little till the last fiscal year, but continuing still, must have had a great effect on this road. Some traffic, too, must have been diverted by new lines, like the Milwaukee & St. Paul's Council Bluffs line, which was open during about one-half of the Northwestern's last fiscal year. The new lines cannot have added much to the traffic, and probably added nothing to the net earnings. They would have done well to earn their working expenses; the profits from them, which are sure, will come hereafter. The great increase in passenger traffic was largely due to immigration, and passenger traffic increased generally in the Northwest last year, the Rock Island gaining 17 per cent. without increasing mileage. The Northwestern's new roads last year gave it traffic chiefly by the movement of passengers and freight to them over the old lines, the Dakota immigrant perhaps riding over 600 miles of old road before reaching the new one on which he settles.

But the decrease of profits last year was not due to decrease in earnings and to but a small extent to the increase in interest, but chiefly to the great increase of $1,336,655 in working expenses. We have seen that the increase in train mileage was even greater, but why should there be an increase of 20 per cent. in freight train movement when there was a decrease in the freight movement? Largely, doubtless, because of this same new mileage. All the road has to be served regularly, but the new roads afford but very little freight. The big train loads are made on lines with heavy traffic and especially through traffic. The increase in freight train mileage, however, does seem extraordinarily great.

All these investments in new roads in unsettled country, by which chiefly the company has increased its mileage 60 per cent. since 1880, are investments for future profits. If wisely located, the new road will all eventually yield a profit which will not only pay a good rate of interest on the money invested, but will make up for the time while waiting for the property to develop. It is always a question how much a company can invest in this way, with no prospect of an immediate return, and the time when a return will come is almost always very uncertain when the investment is made. A new country sometimes lies empty for years after it is made accessible, and then fills up in two or three years; when immigration has begun bad harvests or other misfortunes may interrupt it, as in Southwestern Minnesota after 1871; or it may be diverted by the attractions of some other region. It may be three, and it may be ten years before the country is settled enough to support its railroads fairly.

Now everything has turned out well for the companies that have risked their money in Dakota during the last four years. They built so large an amount of road in so short a time that it seemed quite probable that more country would be opened than there would be immigrants to occupy for a long time. From 400 miles at the close of 1879 the Dakota railroads increased to 2,133 at the end of 1882. It takes a great many people to support 1,700 miles of railroad. But everything has turned out nearly as well as could be hoped for these new lines. The immigration has been great, and as yet shows no signs of interruption. The crops have been good, and in South Dakota this year are especially good, which makes it almost certain that immigration will be large again next year, by which time the population will be large enough, when it has got its land fairly under cultivation (none until the year after arriving), to afford a fair support to most of its railroads, taking into consideration the long haul which the companies owning them get on Dakota traffic east of Dakota.

The prospect is thus very favorable for the Northwestern's new lines, though at present they may reduce and not increase the company's profits. They will certainly increase them some day, unless roads are multiplied in their close vicinity to an improbable extent, and that day now seems to be near at hand. But it may not be so near as some expect, who look for returns from a railroad, in a country barely opened to settlement the year after it is built.

During the current fiscal year the company will have some increase in interest on bonds issued on further additions to its roads, and also on $10,000,000 issued to pay for its purchase last winter of a controlling interest in the shares of the St. Paul & Omaha Company. This latter will require $500,000. If that company continues to pay 7 per cent. on its preferred stock, as it has done heretofore, that will furnish $376,600 toward this. The road makes properly a part of the Northwestern system, as the map published with this report very well shows. The price paid was high, perhaps, but it was the best that could be had, and under the circumstances the purchase was almost a necessity.

The increase of this company's working expenses last year was so great that it will be worth the while to examine them in detail, and compare with previous years.

Renewals of rails must have been far below the average requirements last year. Less than $300,000 were spent on that account, which is but $86 per mile, and would not pay for two tons of rails in track, which would not renew the road in 50 years. The payments on this account were also $400,000 less than the year before. Of course with so large a mileage of new road, comparatively few renewals are necessary.

Repairs of ties cost $272,000, and about $80 per mile of track—nearly the same as the year before.

The total expenditures for maintenance of road has been reported as follows for four years:

	1880.	1881.	1882.	1883.
Total	$1,629,013	$1,921,814	$2,518,320	$2,278,839
Per mile	738	727	830	654

The repairs of other permanent structures (bridges, fences and building) cost:

	1880	1881.	1882.	1883.
Total	$631,547	$808,869	$1,056,099	$1,094.156
Per mile	312	306	348	314

Repairs and renewals of locomotives cost:

	1880.	1881.	1882.	1883.
Total	$488.065	$630,832	$805,853	$928,468
Per engine	1,324	1,325	1.444	1,606
Per engine mile	3.82 cts.	4.12 cts.	4.44 cts.	4.64 cts.

Repairs of renewals of cars were:

	1880.	1881.	1882.	1883.
Total	$588,105	$702,617	$980,288	$1,393,632
Per car	44	42	53	74

For salaries and wages the expenditures have been:

	1880.	1881.	1882.	1883.
Total	$3,694,785	$3,726,132	$3,927,082	$4,354,627
Per mile	1,396	1,409	1,295	1,256

For fuel:

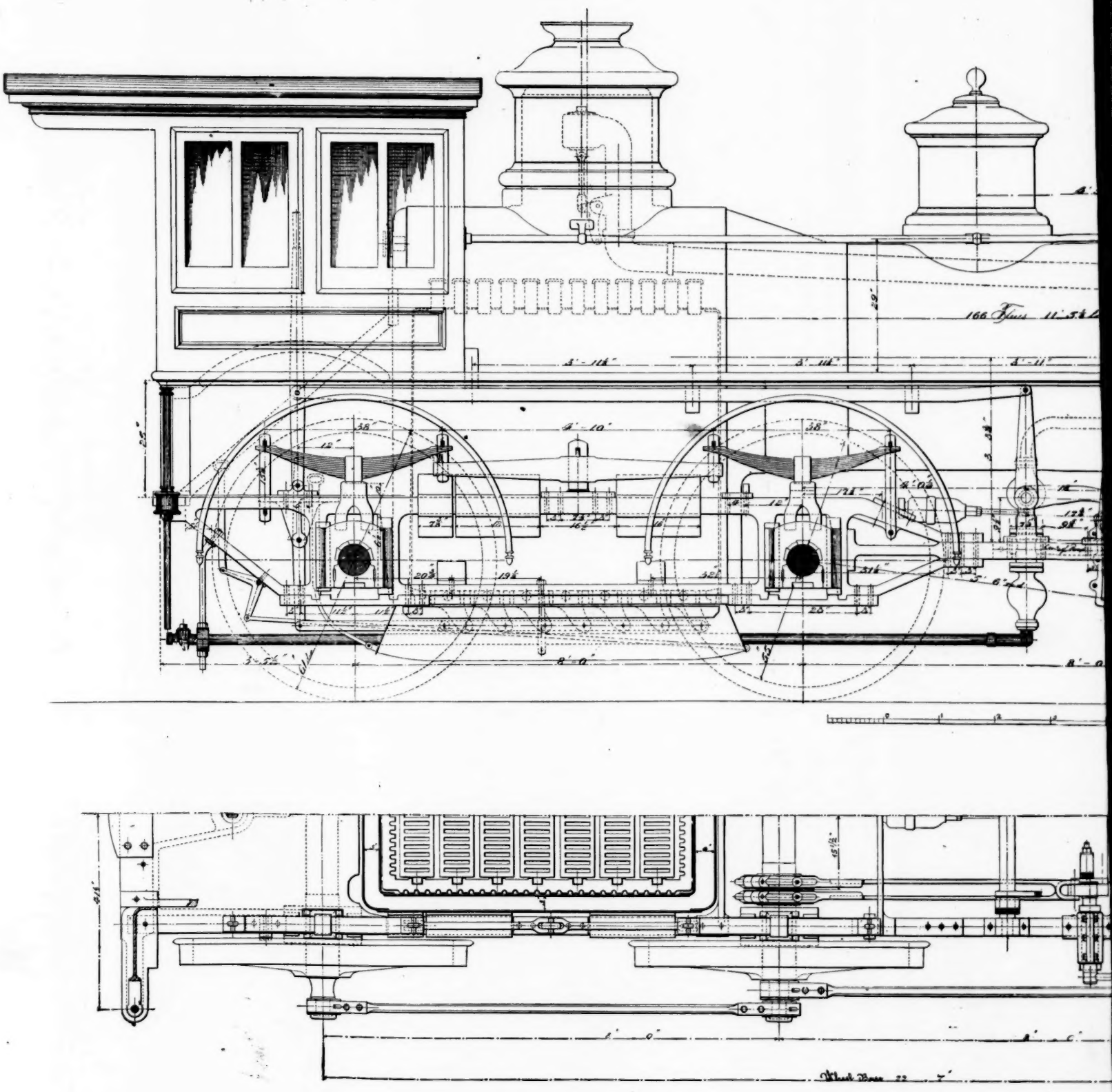
	1880.	1881.	1882.	1883.
Total	$863,566	$1,178,764	$1,598 383	$1,937,295
Per engine mile	6.76 cts.	7.70 cts.	8.80 cts.	9.67 cts

There was thus no considerable increase in maintenance expenses, except for cars, but for these the increase was $413,000, and 40 per cent. in the expenditure per car, bringing it up to $74, which is probably not much above the average for cars kept pretty busy. There is an increase over last year of $427,000 (11 per cent.) in wages paid; and of $339,000 in the cost of fuel. The cost of fuel per engine mile is 10 per cent. more than last year, though the average train load was so much smaller. The price paid for coal has increased from $2.36 per ton in 1881, to $2.51 in 1882 and $2.68 last year, and this accounts for rather more than half of the increase in cost per engine mile.

So far as crops are concerned, there is perhaps no part of the country that promises better this year than that on the lines of the Northwestern and further north. Should the corn escape frost, there can be no doubt that it will have much more grain to carry than in either of the last two years.

THE NEW POOR'S MANUAL.

The sixteenth annual volume of Poor's "Manual of the Railroads of the United States" was issued this week, about a month later than usual. As the Manual consists chiefly of abstracts of the reports of railroad companies, one year after its issue it has none of the last reports of the railroads, and so is useless except for what we may call historical purposes. Therefore, those who use it are likely to complain when its issue has been delayed. The publishers excuse the delay by a fire in the establishment where it is printed, but one look at the volume is sufficient to excuse all delay. Instead of the meagre introduction of last year, of barely 17 pages and only four pages of statistics and some grievous errors in them—these being the only statistics of the railroads of the United States as a whole—we have this year 108 pages of introduction, of which a solid 100 pages are tables, giving most valuable information in a form much more easy to refer to for many purposes than the body of the Manual, or any other railroad statistics published. And there are evidences



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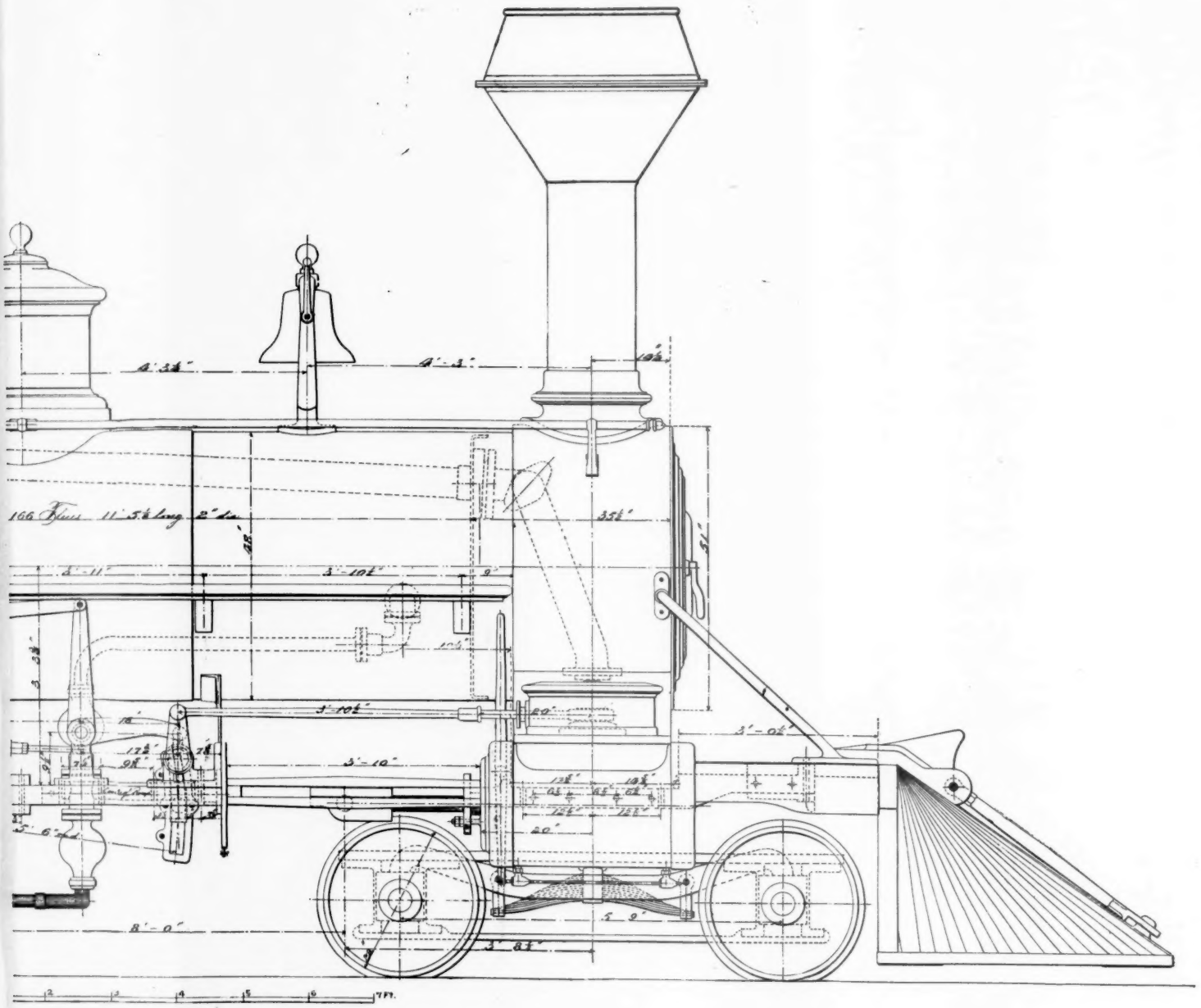

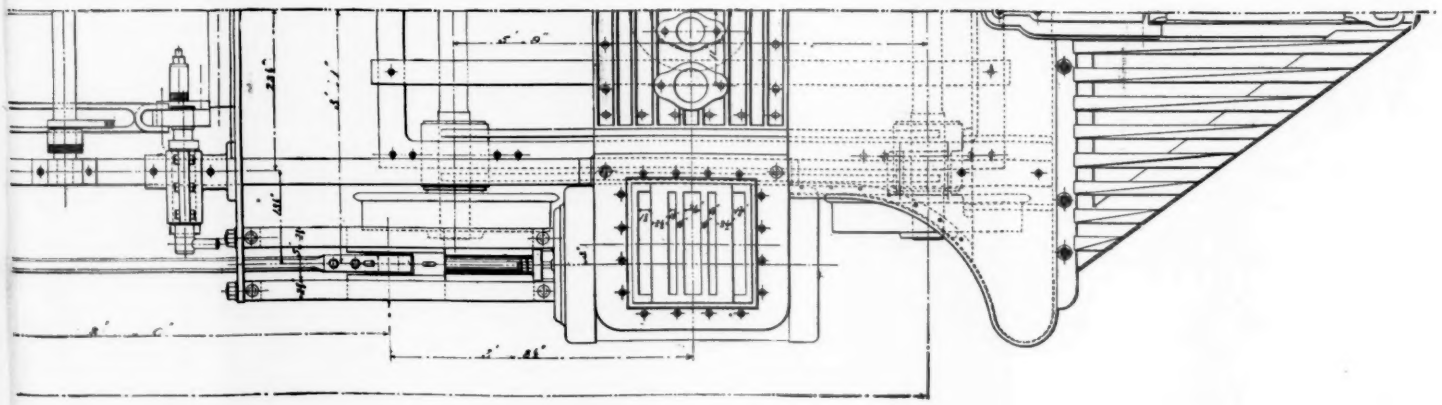

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that unusual care has been taken in the preparation of these statistics, in the numerous and important corrections of last year's statements that have been made.

No one, perhaps, knows better than we the extraordinary difficulty of securing and compiling, in anything like uniform shape, the statistics of *all* the railroads of the United States, for any one not possessing authority to demand the material from the railroad companies, like the Census Bureau. A work of this kind in any event can be only approximately correct and complete. But the issue of the Manual last year was not a creditable piece of work, even when these difficulties are borne in mind. Of course nothing but long use can enable one to vouch for the general accuracy of a work like this, but the evidences of careful, intelligent and conscientious work in this introduction, which must have cost great labor (and all done after the rest of the work was complete) are such that we risk little in saying that no previous issue of the Manual can begin to equal it.

The text of this introduction we publish this week. Two of the 100 pages of tables, giving the main data for each state and group of states, we hope to publish next week, and must defer until then any attempt to deal in any detail with the facts concerning the railroad system of the United States for the year covered by the Manual, which are made known to the world for the first time by this publication.

How far the compiler profited by the census railroad statistics, most of which are still unpublished, but which we have had an opportunity of examining, we do not know. But we find that its statement of mileage agrees quite closely with that of the census, while last year it was greatly in excess. The census found 87,891 miles of railroad completed in the United States June 30, 1880: this number of the Manual reports a total of 91,944 miles Dec. 31 of that year. This makes 4,053 miles constructed in the last half of 1880, which is not far from correct. Mr. Poor seems not to have made use of the careful investigation into the time of the completion of railroads in the United States previous to 1880 which the census has made, as his figures for mileage in the earlier years are generally the same as the Manual has given heretofore.

One of the most useful new features of the Manual is a table of miles owned, amount of stock and bonds (separately), miles worked, and gross and net earnings of every road for four successive years, with the date of the close of the fiscal year specified. In a great many cases these are the only facts that are required, and they can be found here in a moment for every road in a state. This table occupies 42 pages.

It is followed by a table giving, *for every road*, the miles of road owned, of track, of steel track, number of locomotives and of each class of cars, the amount of stock, funded debt, total investment and cost of road and equipment; of length of road worked, passenger and freight-train miles, number of passengers carried and passenger mileage, number of tons carried and ton mileage, gross earnings from freight, from passengers and from all sources, net earnings, total available revenue (including such income as rentals received as well as net earnings), amount paid for interest and amount paid in dividends. This table is really an epitome of the Manual, and for most purposes where no comparison with the preceding yea is required, especially if an examination is to be made of several companies at one time, will be much more convenient. Here, for instance, without looking further, the student may calculate stock, debts, interest charges, dividends, gross and net earnings and traffic per mile of road worked, earnings per train-mile, average train-loads, average rates, etc. Comparisons of roads with each other would be much more frequently made if it were not for the labor of collecting the data. We can imagine an Illinois railroad man opening at the Illinois table and calculating at an odd moment the average freight-train loads of his and his neighbor's roads—Chicago & Alton, 189 tons; Chicago & Eastern Illinois, 178; Chicago & Iowa, 79; Northwestern, 132; Burlington, 187; Rock Island, 109; Illinois Central, 120; Indiana, Bloomington & Western, 128; Peoria, Decatur & Evansville, 110; Vandalia, 126; and perhaps led to reflect profitably on the facts so discovered; or an officer of a Northwestern road, who prides himself that with small earnings he makes larger profits for his employer than are got out of the great Wabash road, becoming more modest on finding that he gets 1½ cents or so per ton per mile for carrying freight, while the Wabash has to put up with 0.95 cents, and that if he had to work as cheaply as the Wabash he could not keep out of bankruptcy for a month. All this, of course, can be found without resorting to this table or the Manual itself; but the table makes it very easy to find it.

Another new feature is a table of the new road constructed in 1882, specifying the roads and parts of roads constructed, which is necessary to give any authority. The Manual reports 11,591 miles completed in 1882 and 9,789 in 1881, and 28,554 miles in the three years since 1879—an increase of 33 per cent, during which time the population of the country increased about 4,930,000, or a trifle more than 10 per cent. A mile of new railrond was thus provided for every 173 additional inhabitants, which they may find convenient, but will hardly like to pay interest on. At the beginning of 1881 there were 533 people per mile of railroad; at the close of 1882 only 481.

Some specially notable facts of the last year reported are given in the part of the introduction which we publish—facts which will help us to understand why the country is not doing quite so well now as it was two or three years ago. There was an addition of 780 millions to stock and debts of the railroads of the country *in a single year*, and in two years the increase has been 1,743 millions. This has been done with very little help from abroad, and within the past three or four years shops, etc., have been extended sufficiently to provide nearly all the materials and equipment of these 28,500 miles of road, which is 10,000 miles more than the total mileage of Great Britain, constructed in 53 years, 11,500 more than the total French mileage, and 7,000 more than that of Germany, which has more than any other European country. France has recently got into financial difficulties by building what was thought to be very rapidly—about 900 miles one year. The investment per individual in this country is at the rate of about $125 per inhabitant—vastly more than in any European country, though our railroads are very much cheaper than the European lines, their average capital per mile being just about one-third that of the English railroads and but half that of the French roads. The increase in gross earnings in two years in this country has been 155 millions, but this increase is not in proportion to the additional mileage. The average expenditure per inhabitant for railroad transportation was $14.38—$3.77 for passenger fares and $9.44 for freight. In 1879 the "railroad tax" per inhabitant was $10.86. The increase of 32½ per cent. since then is by no means insignificant. But the net earnings per dollar of capital were more in 1879 than in 1882. The railroad system has been growing too fast, and the result we but begin to see in the Manual. The 11,591 miles built in 1882 had hardly begun operations in the year covered by it, which includes many thousands of miles of roads whose figures are for a fiscal year ending October, September and June of last year, and very few that ended after December last. Thus operations of the great system of the Northwestern are reported for the year ending with May, 1882; the Louisville & Nashville for the year ending with June of that year, nearly all the New York and New England roads for the year ending with September. The next Manual will have to report not very much greater earnings divided among a much greater mileage and having to pay interest on a larger capital by carrying a production which has increased little and perhaps none.

UNGUARDED SWITCHES.

The late melancholy accident on the Rome, Watertown & Ogdensburg Railroad, by which 23 persons lost their lives and 28 were injured, should lead all railroad managers to inquire how similar accidents may be prevented in the future. The accident can be briefly described. A freight car which was on the side track at Carlyon station is supposed to have been blown out upon the main track by the force of the wind. A heavy passenger train drawn by two engines ran into this car, and the collision resulted in the death and injury of over 50 passengers.

The cause of the accident is not an unusual one. Many similar cases have occurred in this country, and dozens of accounts of them could be quoted from the British Board of Trade reports. Accidents are also very liable to happen at side tracks from switches being left so as to lead to the siding, which fact, in many places, cannot be observed by the locomotive runner in time to stop, if no other warning is given than that of an ordinary switch target. There are thousands of such unguarded switches in the country, and at many of them accidents of this kind are liable to happen at any time.

How can such switches be made secure, and such accidents be prevented?

For an answer to this question we may profitably refer to the British Board of Trade reports on railroad accidents and to the recommendation made by its inspectors after investigating similar accidents. It may be remarked here that it is to be regretted that these reports are not more accessible to railroad officers than they are. It is true that the yearly issues since 1853 have made them so bulky that few would have time to study or examine them with care. They contain, however, a perfect mine of information concerning the operation of railroads and of all kinds of accidents which occur on them.

As briefly as possible some of the recommendations contained in these reports concerning the prevention of such accidents as the one which occurred on the Rome, Watertown & Ogdensburg road will be quoted.

On the 24th of March, 1869, the night mail train on the Chester & Holyhead Railway ran into a "coke wagon" at Bangor. Of this accident Captain Tyler reported:

"There seems no doubt that the wagon in question must have been blown from the position in which it was left to the point where it was run into, a distance of 300 yards.

"A safety siding, which the engineer of the company appears to prefer to a chock-block, should be added in order to prevent such an accident from again occurring."

On the 9th of April, 1858, a train was ascending the incline from Kingstown to Dalkey, on the Dublin & Wicklow Railway, when the engine came in contact with two wagons loaded with granite, which were running wild down the incline. These wagons had been standing on the siding at Dalkey, and the men in charge of them said that "there was a great storm blowing, and that the rails were greasy, and though they had brakes down, and had 'shrogged' the wheels, they were unable to control the wagons, which burst through the points, though held against them."

Colonel Wynne, who investigated this accident, reported that it "arose from the siding being improperly constructed. Being itself partly on the incline, it should have been made to terminate in a blind siding, instead of leading directly into the main line."

On the night of Dec. 19, 1862, the engine of the express Irish mail train on the Chester & Holyhead section of the London & Northwestern Railway came into contact with an empty wagon, and the whole of the vehicles in the front part of the train were thrown off the rails. The wagon had been left on a siding, and as the wind was blowing strongly it is supposed it was blown out on the main line. Colonel Yolland investigated this accident and reported as follows:

"Several instances have occurred, on the Chester & Holyhead Railway, of wagons having been blown out of sidings on to the main line; and the London & Northwestern Railway Company have now determined to take effectual measures for the prevention of accidents of this class, by constructing catch sidings for the reception of wagons that may be moved by the wind, and thus keeping them from running on to the main line."

Aug. 30, 1863, a passenger train on the West Cornwall Railway ran into a "tipping wagon," which had run from a siding into the switch connected with the main line, so as to obstruct the latter. Colonel Rich, who investigated the accident, expressed the opinion "that it was driven there by the wind." In his comments on the accident he said:

"A chock-block has been added since the accident, but I recommend that a second block be put at the eastern end of the siding to mark the place outside which no trucks should be left; that spring padlocks, requiring keys to open them, but not to lock them, be provided for the blocks; that indicators be attached to the points, and that a *catch siding*, to stop runaway trucks, be added to the western end."

Jan. 25, 1867, a goods train, in backing into a siding at North Rode junction, on the North Staffordshire Railway, pushed several wagons so far that they fouled the main line. Shortly afterwards a passenger train ran into these wagons. Colonel Rich reported on this accident as follows:

"It appears desirable that all mineral sidings, where they join main lines, should be protected by blind sidings, with points loaded, so as to remain open for the blind siding."

After a similar accident which occurred on the North British Railway, Dec. 16, 1867, Colonel Hutchinson made the following recommendations:

"At an important station like Ratho, close to two junctions, it seems most desirable that the main lines should be better secured against the sidings than by chock-blocks, the fastening of which is so often neglected, and this might easily be done by introducing safety points, controlled by low signals, interlocking with the main signals, these low signals, when at danger, preventing the safety points being set right for the main line."

With reference to another accident which occurred on the London & Northwestern Railway in 1872, which was caused by a train being pushed so far into a siding that one of the wagons fouled the main line, Captain Tyler said:

"It is very surprising that a great company like the London & Northwestern Company should, after all the warnings which they have received, have neglected to add safety points at the end of such sidings, and especially when their attention has been so constantly drawn to the necessity for providing such safety points."

The list of similar recommendations could be very largely increased from these reports. In 1872 the Board of Trade issued among the requirements for new lines of road and recommendations for old ones that—

"All sidings connected with passenger lines be supplied with a blind siding or safety point, with the points or point closed against the main line, and interlocked with signals."

A long list of accidents could also be quoted from

the Board of Trade reports, which were caused by trains running into sidings owing to the switches being misplaced. Such accidents are, however, not so common on British railroads as they are here, owing to the fact that the Board of Trade has prohibited the use of what are called "facing-points," except on single lines, or at junctions, or in exceptional cases, and therefore what are there called facing-points are being rapidly abandoned on all double-track roads. Almost the only switches used on British railroads are what we call split switches. These are laid so as to be what are there called "trailing-points," that is, they are placed so that trains run from the heel of the switch rails towards the point. If set the reverse way they are called "facing-points." The objection made in this country to using trailing-points only is that they require that trains should be backed into sidings from the main line, which is certainly a greater objection here with our heavy trains than it is on British roads, where freight trains generally are not as heavy as here. On single-track roads, of course, it is impossible to use trailing-points only. It will be understood by most experienced railroad men that if a split switch is used as a trailing-point, even if it is set for the siding, a train on the main track will throw it over, and that the train is not likely to be derailed. Facing-points, unless properly protected, are undoubtedly prolific causes of accidents.

As the means which are ordinarily employed for guarding against accidents by cars on sidings running out and "fouling" or obstructing the main track, and from trains on the main track running into sidings are not generally understood here, we give this week a number of diagrams showing the arrangement for sidings and signals for double and single-track lines, and with both facing and trailing points.

Figs. 1 and 4 represent a siding on a double-track line with a facing-point at A' and a "throw-off" switch at A. In fig. 1 the switch A' is set for the main line and the throw-off switch is open so that if a car on the siding were blown or otherwise moved off it would run off the rails by the short spur track on the right of A. In fig. 4 the switches A' and A are both set for the side-track. These two switches are moved simultaneously by a lever opposite A'. It is obvious, though, that in approaching a facing-point it is important that a locomotive runner should have warning some distance in advance of the switch to indicate its position. For this purpose a signal, S, is placed a housand feet or more beyond A'. This is operated by a wire and is weighted so as to fall to indicate danger in case the wire should break. This signal is also worked by a lever alongside of the switch lever and the two are so arranged that when the switch A' is set for the main track, as in fig. 1, the lever with which it is moved will then be locked, and neither it nor the switch can be moved until the signal S is first raised to indicate danger. The movement of the signal lever releases the switch lever, and the switch can then be moved for the siding as shown in fig. 4. In doing this the movement of the switch lever locks the signal lever so that it is impossible to lower the signal S to indicate that the line is clear. It will thus be seen that it is impossible to give a signal indicating that the line is clear without first setting the switch S for the main line, and that it cannot be moved to connect with the siding without first raising the signal S to indicate danger. It is thus impossible to give a wrong signal.

The switches A and A' are so connected to the lever by which they are operated, that when A' is connected with the main track, A connects with the spur, so that if a car should run out of the siding when the main line is clear, the car would be run off at the spu With this arrangement, the signal S could be lowered to indicate danger when the switch A' is set for the main line, but this can do no harm, excepting to stop trains unnecessarily. It is important, too, to be able to set the signal S at danger when the switch is set for the main line, so as to protect through trains from accident when cars are being switched to or from the siding.

Figs. 2 and 5 represent a trailing switch protected in the same way. In this case the apparatus used is identical with that employed for figs. 1 and 4.

Figs. 3 and 6 represent a siding for a single line. Here the switch must be both facing and trailing, as the trains run over it both ways, and it is also essential to protect the switch with signals S and S' on both sides of it. Both signals are worked with one lever; otherwise the apparatus used is the same as in the preceding figures.

Had the Rome, Watertown & Ogdensburg Railroad been equipped with such appliances at Carlyon, it would have been impossible for a car on the siding to be blown on the main track, and if, as stated, that was the cause of the accident, the lives of the 23 passengers killed there would have been saved, and the incalculable suffering of the 28 who were injured would have been prevented.

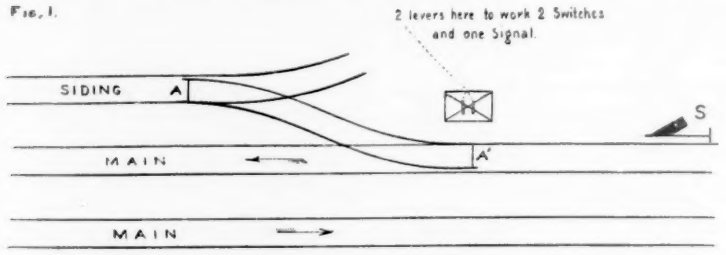
For fear that it may be thought by some railroad officers that this is a new contrivance, which has recently been evolved out of the brain of some prolific inventor, it should be said that it has been used in hundreds and hundreds of cases, that it has been thoroughly tried, and is as much an established practice as any signaling device well could be.

Of course, sidings which are not level are much more dangerous than those which are, and facing-points more so than trailing-points. It would seem then to be of the utmost importance that all sidings which are laid with a grade or incline should at once be protected in the manner described. Of course a throw-off switch could be used without a distant signal and interlocking apparatus, but in cases where the switch can be seen for only a short distance, it is of the utmost importance that both should be used.

Nothing has been said here of the mechanism employed for the switch and signal levers, and to effect the interlocking.

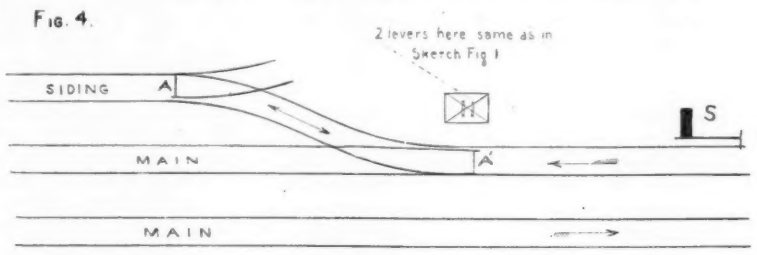
Apparatus of this kind was fully illustrated and described in the *Railroad Gazette* of Feb. 11, 1881. In a future number other similar appliances will be illustrated, the purpose of this article being to impress upon railroad managers the importance of providing some effective safeguard to prevent such melancholy accidents as that which occurred at Carlyon.

FIG. 1.



Figs 1,2,3 { Switches right for Main tracks. Signals at "All Clear." Nothing can foul the Main track from the Siding.

FIG. 4.



Figs. 4,5,6. { Switches right for Sidings, (to or from) Signals at "Danger."

FIG 2

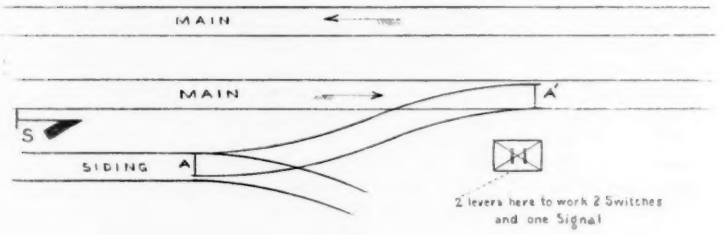


FIG 5

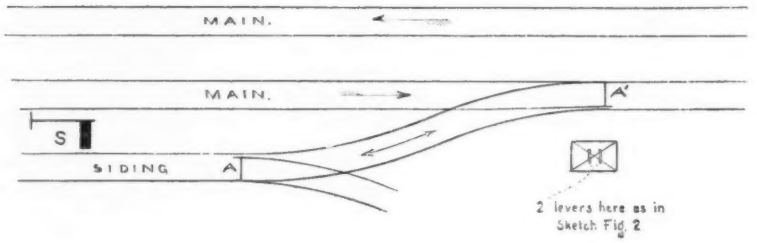


FIG 3

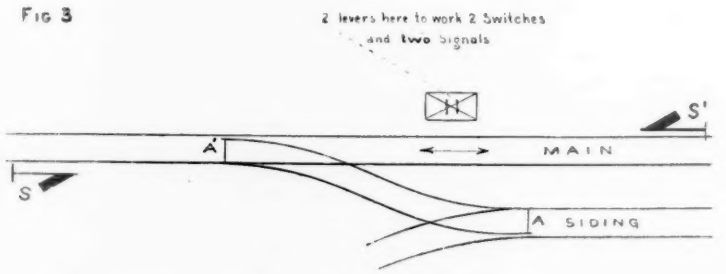
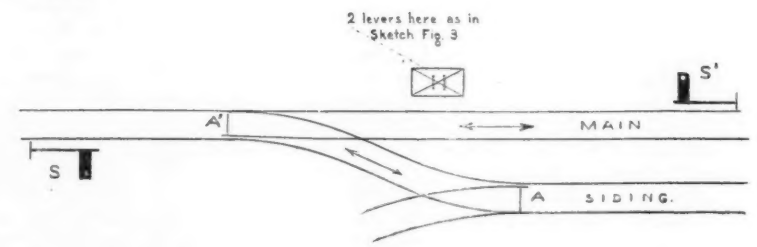


FIG. 6.



JULY EARNINGS.

An unusually large number of the railroads that have reported their July earnings for this year so far show a decrease in comparison with last year, and several a quite large decrease. And this is the more significant because for many roads July was an unfavorable month last year. It was at the end of a wretched crop-year for them, and the movement of cotton, spring wheat and corn was extremely small; but for the roads which carry winter wheat from the more southern territory where it is grown extensively —from Kansas, Missouri, and the southern half of Illinois, Indiana and Ohio, as well as Kentucky—at least half of it was an unusually favorable season, for the very large new crop of winter wheat was marketed to an extent scarcely equaled in any previous July. But few of the roads reporting reflected this, however, as their gain in wheat was often not equal to their loss in corn. The Atchison, Topeka & Santa Fe, the Missouri Pacific, the Alton & Terre Haute, the Peoria, Decatur & Evansville, the Illinois lines of the Illinois Central, the Fort Scott & Gulf, the Evansville & Terre

Haute, the Louisville, New Albany & Chicago, the St. Louis & San Francisco, the Scioto Valley and the Wabash, which serve this southern wheat country, showed increases in July last year, truly, and several of them large ones; but in the case of the Atchison, the Fort Scott & Gulf and the Scioto Valley, the increase was not as great as in the previous month of the year, while the Chicago & Alton, the Hannibal & St. Joseph and the Missouri, Kansas & Texas, which should have been carrying a goodly share of the new Kansas and Missouri wheat, suffered a *decrease* in earnings compared with 1881. The principal roads northwest of Chicago, with the exception of those northwest of St. Paul, did very poorly last year in July; three of them with 8,710 miles of road earned $112,723 less than in July, 1881, when they had but 7,550 miles of road and their average earnings per mile fell from $521 to $439.

Of 11 roads that suffered a decrease in earnings in June this year, all but two had a decrease in July also, while ten that reported a gain in June suffered a decrease in July (Chicago & Eastern Illinois; Cincinnati, Indianapolis, St. Louis & Chicago; Green Bay, Winona & St. Paul; Hannibal & St. Joseph, Illinois lines of the Illinois Central, Missouri Pacific, Ohio Central, Belleville line of the Alton & Terre Haute, St. Louis & Cairo, and St. Louis & San Francisco). These ten roads in June made an aggregate gain of $195,917 over last year; in July they suffered an aggregate loss of $259,143. Moreover, the Evansville & Terre Haute, the Peoria, Decatur & Evansville, the Alton & Terre Haute Main Line, the Manitoba, and the Wabash, which lost in both months, had much larger decreases in July than in June, their aggregate decrease having been $118,025 in June and $546,001 in July. Further, a large number of roads which had an increase both in June and July, had a considerably smaller increase in July. Fourteen such roads gained in the aggregate but $274,978 in July, against $575,798 in June.

Against this we find that the Central Iowa and the Mobile & Ohio, which together lost $18,637 in June, gained $11,048 in July; the Central Pacific, the Marquette & Ontonagon and the Union Pacific, which lost both months lost much less in July (about $122,990, against $357,889 in June), and 11 roads which gained both months gained much more in July than in June. These eleven roads are the Denver & Rio Grande, the East Tennessee, the Gulf, Colorado & Santa Fe, the International & Great Northern, the Iron Mountain, the Memphis & Charleston, the Missouri, Kansas & Texas, the Northern Pacific, the St. Paul & Duluth, the St. Paul & Omaha, andthe Texas & Pacific. Their aggregate increase in earnings was $592,897 in June and $958,173 in July.

From this distribution the reader will be able to see where the railroads have shown an improving tendency and where the reverse. Sixteen did better than in June (compared with the last year) and 29 did worse.

There were 11 other roads which showed little difference between their June and their July gains, and in their aggregate gained $613,219 in June and $562,214 in July.

The 56 roads which have reported for June and July made an aggregate gain of $878,279 in July, and of $1,483,280 in June. Their aggregate length was about 3,660 miles greater this year, so that the increased earnings were at the rate of $405 per mile of additional road in June and $240 in July.

The average earnings per mile in July of all the roads reporting *decreased* from $486 last year to $463 this year—just 5 per cent.

As we said in reviewing June earnings two weeks ago, we had throughout the first half of this year very unfavorable months to compare with because the crop movement in the first half of 1882 was remarkably light. To some extent, and on several lines to a very great extent, the unfavorable crop movement last year was neutralized by great activity in other traffic. With July last year there was a great increase in grain movement for a number of roads. Yet, as we showed in speaking of the grain movement last July, the total July movement was not large last year and but little larger in the last half of the month than the year before. As we show elsewhere this week the wheat movement was very large in the last half of July last year, and this profited certain roads greatly. This year, though there is a much larger surplus of the old crop to market, the total grain movement in July was exceptionally small. The receipts at the eight Northwestern markets in July (five weeks to Aug. 4) have been, in bushels:

1879.	1880.	1881.	1882.	1883.
23,964,148	34,781,702	28,090,191	23,527,295	18,920,576

For corn carriers, July was much better this year than last; but for winter wheat carriers last year was very much the best. But as nearly all the winter wheat country is also a great corn country, gains of one tend to neutralize losses of the other on many roads.

As, on account of the recent great fall in the prices of stocks, there is just now unusual interest in the course of railroad earnings, we have below compiled tables of the earnings, mileage worked, and earnings per mile for *four successive years* for such roads as have reported for all these years, arranged by groups, subjoining some roads whose earnings are not given for all these years. Beginning with the Northwest we have:

West and Northwest of Chicago.

	1880.	1881.	1882.	1883.
Manitoba	$272,089	$387,488	$853,296	$612,766
Miles	656	850	1,020	1,326
Earn. per mile	$415	$456	$837	$462
Northern Pacific	$241,277	$393,260	$694,068	$841,000
Miles	722	754	1,293	1,701
Earn. per mile	$334	$521	$535	$494
St. Paul & Duluth	$52,463	$71,412	$96,699	$137,973
Miles	175	175	196	210
Earn. per mile	$300	$408	$493	$657
Chic. Mil. & St. P.	$1,026,708	$1,568,706	$1,464,927	$1,829,000
Miles	3,111	3,800	4,260	4,523
Earn. per mile	$330	$413	$320	$404
Chic. & Northwest	$1,699,686	$1,983,631	$2,059,952	$2,170,900
Miles	2,490	2,800	3,250	3,590
Earn. per mile	$682	$708	$634	$605
Ch., St. P., Minn & Om	$236,995	$383,202	$359,459	$433,830
Miles	780	950	1,040	1,230
Earn. per mile	$304	$403	$346	$353
Burl., C. R. & Nor.	$143,433	$174,351	$198,276	$195,589
Miles	492	564	645	714
Earn. per mile	$292	$309	$307	$275
Ill. Cen in Iowa	$136,363	$171,686	$.40,052	$147,495
Miles	402	402	402	402
Earn. per mile	$339	$426	$348	$368
Mil., L. S. & W.	$29,897	$49,631	$98,993	$81,835
Miles	218	2?0	275	325
Earn. per mile	$137	$199	$251	$252
Chic & Alton	$708,906	$676,205	$702,635	$71?,956
Miles	840	840	850	850
Earn. per mile	$844	$805	$827	$842
Han. & St. Jos.	$224,312	$201,899	$192,240	$179,959
Miles	292	292	292	292
Earn. per mile	$768	$691	$658	$616
Total	$4,772,129	$6,060,871	$6,830,597	$7,346,703
Miles	9 625	11,677	13,528	15,163
Earn. per mile	$496	$519	$505	$485
Central Iowa		$88,713	$91,587	$109,972
Miles		190	290	340
Earn. per mile		$467	$316	$306
Green Bay, W. & St. P.		$32,472	$26,792	$26,343
Miles		220	220	220
Earn per mile		$148	$122	$120

If the reader wishes to get information from this table he must examine not the total earnings only, but the mileage and earnings per mile. This group of roads has been growing in length with tremendous rapidity, and besides other roads in the same district have been built, competing with some of these for their traffic. The Illinois Central, the Chicago & Alton and the Hannibal & St. Joseph are the only ones of the eleven that have not added largely to their mileage. In the aggregate the length worked this year was 1,635 miles (12 per cent.) more than last year, 3,485 miles (30 per cent.) more than in 1881, and no less than 5,538 miles (57½ per cent.) more than in 1880.

This growth is something extraordinary. No consideration of these properties which fails to take account of it has any value. It has brought with it not only increased earnings, but increased working expenses and fixed charges. A few of the roads were but fairly beginning to work in 1880, and these generally show great increases in earnings per mile since that year. (Witness the Manitoba, the Northern Pacific, the St. Paul & Duluth, the St. Paul & Omaha, and the Milwaukee, Lake Shore & Western.) But in other cases the large mileage of new roads has brought down the earnings per mile. Only three of the 11 roads had smaller total earnings this year than last, but six had smaller earnings per mile. The St. Paul & Duluth and the Milwaukee, Lake Shore & Western have gained every year in earnings per mile, and the former has made great progress, and, next to the Chicago & Alton, heads the list, as the short lake outlet of the new and important traffic centre of the Northwest might be expected to do. On the other hand the Northwestern, the Burlington, Cedar Rapids & Northern and the Hannibal & St. Joseph had smaller earnings per mile this year than in any other of the four. The two former have reduced their average earnings by their additions of new road. The Northwestern, however, still has much more than the average earnings per mile. The average earnings per mile of the whole group were less this year than in any of the others; 4 per cent. less than last year, 7 per cent. less than in 1881, and 2 per cent. less than 1880.

The absolute amount of the earnings per mile deserves notice. In no case is it very large. Two roads have less than $300 and four less that $400 per mile.

The most notable change from last year is the great decrease on the Manitoba, which last year earned much more per mile than any other in the list, and this year is exceeded by five and is below the average. The large decrease in total earnings in the face of a large increase in mileage must be due to the diversion of Manitoba and Canadian Pacific traffic to the Lake Superior line of the Canadian Pacific, and to the reduction of through rates caused thereby. They remain large for so new a road, however, 15 per cent. more than the Milwaukee & St. Paul's. The large gain of 33 per cent. of the St. Paul & Duluth, and of 26 by the Milwaukee & St. Paul, are also notable. But on the whole these roads have an addition of but $516,106 to support their 1,635 miles of new road—about $316 per mile. The interest charge must be very low to enable them to do this, and it may very likely be that the increase in expenses has absorbed nearly or quite the whole increase in earnings—as was the case on the Northwestern in its last fiscal year. If we go back to 1881, we have an increase of $1,285,832 in earnings and 3,485 in miles, or $369 per additional mile, and the gain since 1880 of 5,538 miles and $2,574,573, is $457 per mile. The gains are as much as could be expected when so large a proportion of the road is new, but the increase in the surplus profits of the roads is probably much less than most people suppose, who are struck by the gains in total earnings.

Take now the roads west and southwest of St. Louis, another system which has been growing rapidly. As the Missouri Pacific, which is, perhaps, the most important of these, did not report for 1880, we foot the table for three years only:

West and Southwest of St. Louis.

	1880.	1881.	1882.	1883.
Missouri Pacific	.....	$568,507	$734,008	$704,734
Miles	.....	800	935	1,025
Earn. per mile	.....	$711	$785	$688
Central Branch	.....	$82,004	$57,960	$93,852
Miles	.....	300	388	3?8
Earn. per mile	.....	$273	$149	$242
Mo., Kan. & Tex.	$325,167	$484,576	$482,384	$500,649
Miles	786	900	1,296	1,386
Earn. per mile	$414	$538	$372	$426
Iron Mountain	$363,454	$633,512	$515,5?9	$585,590
Miles	685	685	795	905
Earn. per mile	$531	$779	$648	$647
Int. & Gt. Nort'n.	$96,?06	$196,002	$223,256	$269,052
Miles	536	623	775	825
Earn. per mile	$180	$315	$288	$326
Texas & Pacific	$133,951	$328,003	$379,45?	$537,743
Miles	5?0	825	1,234	1,487
Earn. per mile	$268	$358	$307	$362
St. L. & San. Fr.	$173,788	$252,333	$318,613	$280,020
Miles	592	592	660	750
Earn. per mile	$294	$426	$483	$373
Little R. & Ft. S'h.	.....	$32,236	$27,358	$30,681
Miles	.....	168	168	168
Earn. per mile	.....	$197	$163	$180
Gulf, Col. & S. F.	.....	$66,052	$93,732	$166,555
Miles	.....	260	429	534
Earn. per mile	.....	$254	$218	$312
Total	.....	$2,543,435	$2,832,231	$3,282,641
Miles	.....	5,133	6,680	7,468
Earn. per mile	.....	$496	$424	$440

In the aggregate these Southwestern roads did better in July this year than last, but not so well as in 1881. The Missouri Pacific and the St. Louis and San Francisco, however, had smaller total earnings this year than last, notwithstanding an increase of mileage. The fact that there were heavy shipments of wheat last year from the country which they serve, and but light ones this year, may account for this, or partly so.

The International, the Texas & Pacific and the Gulf, Colorado & Santa Fe had their largest earnings per mile this year, but they were all small. Indeed, all these Southwestern roads have light earnings except the Missouri Pacific and the Iron Mountain. There are large increases over last year in earnings per mile on the Central Branch, the Missouri, Kansas & Texas, the International & Great Northern, and the Gulf, Colorado & Santa Fe, when none of them did so well as in 1881. Indeed, last year only the Missouri Pacific and the St. Louis & San Francisco earned as much per mile as in 1881.

We pass now to the roads east of Chicago and the Mississippi (with the exception of part of the Wabash) north of the Ohio and west of Pennsylvania, in which territory are the outlets to the East of both the Northwestern and the Southwestern groups of roads, as also largely of several important roads in the South east of the Mississippi. It should be said, however, that the roads that carry most of this through traffic do not report—but one of the Chicago roads and but two of the St. Louis roads. These—the Chicago Grand Trunk, the Wabash and the Alton & Terre Haute Main Line (which is the Vanderbilt line to St. Louis)—are indeed the only roads in this list which have a considerable through traffic. Most of them, moreover, are small and not very important roads. Eleven of the 13 in the table below had in the aggregate but 3,127 miles of road, an average of but 284 miles each, while on 11 Northwestern roads averaged 1,378 miles, and on nine Southwestern roads 830 miles each. On this account the aggregates of this group cannot safely be taken to represent the general condition of railroad business in this great central region; but it should indicate to some extent the course of its *local* traffic. The earnings, miles and earnings per mile of these roads were:

North of the Ohio.

	1880.	1881.	1882.	1883. *[1]
Wabash	$1,065,080	$1,131,752	$1,418,837	$1,216,409
Miles	1,928	2,480	3,350	3,520
Earn. per mile	$552	$456	$424	$346
Lake Erie & W.	$118,352	$124,459	$105,866	$77,913
Miles	302	386	386	386
Earn. per mile	$327	$322	$274	$202
Ind., Bloom. & W.	$173,377	$199,125	$205,072	$217,618
Miles	402	555	695	695
Earn. per mile	$431	$359	$295	$313
Terre Haute Main Line	$168,153	$118,844	$130,986	$99,422
Miles	195	195	195	195
Earn. per mile	$708	$609	$672	$510

	1880.	1881.	1882.	1883.
Terre Haute Belleville Line	$52,924	$46,549	$73,640	$54,720
Miles	121	121	121	121
Earn. per mile	$437	$384	$609	$452
Ill. Cen., in Ill.	$587,732	$548,318	$616,782	$519,758
Miles	918	918	919	928
Earn. per mile	$640	$597	$671	$560
Peoria, Dec. & Ev.	$42,695	$51,913	$73,741	$45,820
Miles	190	248	254	254
Earn. per mile	$225	$209	$290	$180
Chic. & E. Ill.	$114,128	$125,139	$151,763	$126,354
Miles	220	220	245	245
Earn. per mile	$519	$568	$619	$516
Cin., Ind., St. L. & C.	$204,138	$177,161	$217,108	$185,390
Miles	300	300	384	384
Earn. per mile	$680	$590	$566	$483
Det., Lansing & N.	92,699	$112,707	$122,894	$121,755
Miles	209	226	226	226
Earn. per mile	$444	$499	$544	$537
Flint & Pere M.	$113,489	$137,640	$148,503	$184,427
Miles	300	318	345	347
Earn. per mile	$378	$432	$430	$531
Scioto Valley	$33,959	$39,073	$45,462	$47,526
Miles	100	128	128	128
Earn. per mile	$340	$305	$255	$371
Total	$2,736,696	$2,812,689	$3,310,744	$2,896,612
Miles	5,391	6,241	7,394	7,575
Earn. per mile	$508	$451	$448	$382
Chic. & W. Mich.	$61,655	.....	$111,949	$117,076
Miles	267	.....	367	404
Earn. per mile	$231	.....	$305	$290
Ohio Central	.....	$55,226	$85,572	$84,730
Miles	.....	232	232	284
Earn. per mile	.....	$238	$369	$298
Ohio Southern	.....	$22,195	$27,494	$29,254
Miles	.....	128	128	138
Earn. per mile	.....	$173	$199	$212
Chic. & Grand T.	.....	$99,241	$135,882	$200,368
Miles	.....	335	335	335
Earn. per mile	.....	$293	$406	$598

These roads have made but a very small increase in mileage since last year, and nearly all that was by the Wabash. But the increase over 1881 is 1,331 miles (21 per cent.) and over 1880 it is 2,184 miles (40 per cent.). But there is a *decrease* from last year of $414,132 (12½ per cent.) in their aggregate earnings, and the gain of 1,484 miles over 1881 is accompanied by a gain of but $83,932 in earnings, and the gain of 2,184 miles over 1880 by but $152,916 in earnings. It is evident, therefore, that the net earnings of these roads must have been less this year than in any other of the four, and their surplus over fixed charges materially less. The earnings per mile, we see, have decreased continuously, and this year are 15 per cent. less than last year, and 24 per cent. less than in 1880. Almost the only roads in the list which can be said to have done well this year are the three last named. The Lake Erie & Western, the Terre Haute Main Line, and the Illinois Central (in Illinois) all had smaller *total* earnings in July this year than in any of the other three, and the Wabash, the Peoria, Decatur & Evansville, the Chicago & Eastern Illinois, and the Cincinnati, Indianapolis, St Louis & Chicago also had their smallest earnings per mile this year. The Wabash especially the Lake Erie & Western and the Peoria road make a very bad showing.

There are more roads in this group than in any other which are affected by the winter wheat movement. Several of these profited by the heavy July movement of last year, as the Wabash, both the Terre Haute roads, the Illinois Central, and the Peoria road, and all these but the Wabash had unusually large earnings last year. The movement of this grain was very light this year, and indeed this side of Kansas there was not much to move, but on the other hand, there was no corn to carry last year, and there was a great deal more this year, which should be felt by all these roads. The fact that there are too many of the roads has more to do with their light earnings, probably, than anything that has happened to the crops. Unlike the roads west of the Mississippi, they are in a country where agriculture grows scarcely at all, and where other industries have probably made very little progress during the past year, but great progress during the three previous years. We shall find the returns made by the Southern roads east of the Mississippi more encouraging. We have reports from the following:

South of the Ohio and the Potomac.

	1880.	1881.	1882.	1883.
Mobile & Ohio	$130,740	$150,430	$135,173	$136,836
Miles	506	506	528	528
Earn. per mile	$258	$297	$256	$259
Louisville & Nashville	$772,537	$817,135	$1,063,765	$1,139,300
Miles	1,702	1,840	2,028	2,071
Earn. per mile	$454	$439	$525	$550
Memphis & Chas.	$68,634	$90,059	$68,211	$89,015
Miles	292	292	292	292
Earn. per mile	$235	$308	$234	$307
E. Tenn., Va. & Ga.	$195,556	$222,769	$236,349	$298,134
Miles	775	900	900	1,000
Earn. per mile	$252	$248	$263	$279
Ches. & Ohio	$238,236	$225,096	$316,787	$336,475
Miles	435	435	511	517
Earn per mile	$548	$517	$620	$651
Rich. & Danville	$145,639	$153,632	$244,380	$272,282
Miles	451	451	757	757
Earn. per mile	$323	$341	$336	$360
Total	$1,551,342	$1,659,101	$2,064,755	$2,270,879
Miles	4,161	4,424	5,016	5,295
Earn. per mile	$373	$373	$412	$424
Ill. Cen., So. Div.	.....	.....	$222,625	$240,625
Miles	.....	.....	578	578
Earn. per mile	.....	.....	$385	$416
Lex. & Big Sandy	.....	.....	$51,666	$60,237
	.....	.....	130	130
	.....	.....	$397	$463
Rich. & Dan. controlled lines	.....	.....	218,681	259,137
Miles	.....	.....	1,145	1,174
Earn. per mile	.....	.....	$191	$221

There remain many which have not yet reported. A larger proportion of the roads report in this section than in any other. The six that have reported for the four years we see have larger earnings per mile this year than in any other, and the Mobile & Ohio is the only considerable exception to this. The three roads whose earnings are given for the last two years only also show large gains this year. The good crops of last year are evidently still felt in the South.

Of Eastern roads we have, so far, reports only from the three following, which may pass for what they are worth:

	1880.	1881.	1882.	1883.
Grand Trunk	.....	$1,174,192	$1,241,870	$1,300,803
Miles	.....	1,934	2,225	2,222
Earn. per mile	.....	$605	$558	$560
N. Y. & New Eng.	$210,257	$246,820	$298,441	$309,288
Miles	282	316	396	399
Earn. per mile	$746	$781	$7 8	$775
Long Island	.....	$243,850	$352,413	$366,944
Miles	.....	328	354	354
Earn. per mile	.....	$744	$995	$1,037

This is a very good showing, but the roads are not representative lines, and we may not argue that generally Eastern roads have done as well.

We now take up the three great railroad systems of the Far West that have reported:

	1880.	1881.	1882.	1883.
Union Pacific	$1,934,215	$2,526,000	$2,300,000	$2,268,000
Miles	3,056	3,450	3,720	4,332
Earn. per mile	$633	$732	$618	$524
Denver & R. G.	$372,190	$548,284	$489,400	$647,000
Miles	505	847	1,066	1,643
Earn per mile	$737	$647	$459	$ 94
Central Pacific	$1,840,067	$1,899,246	$2,076,648	$2,023,000
Miles	2,428	2,635	3,006	2,977
Earn per mile	$758	$721	$691	$681
Total	$4,146,472	$4,973,630	$4,866,048	$4,938,000
Miles	5,989	6,932	7,792	8,947
Earn per mile	$695	$717	$624	$525

All these had smaller earnings per mile this year than in any other of the four, and all but the Denver, which has 54 per cent. more miles, had smaller total earnings than last year. The decreases of the Union and Central Pacific, however, are much less than they have been in some previous months of this year.

Chicago, Burlington & Quincy Earnings and Expenses.

The earnings and expenses of the Chicago, Burlington & Quincy Railroad (including the Burlington & Missouri River Railroad in Nebraska) in the month of June this year and last were:

	1883.	1882.	Increase.	P. c.
Gross earn.	$1,937,916	$1,437,164	$500,752	24.8
Expenses	933,228	921,041	72,187	7 8
Net earn.	$994,688	$516,123	$478,565	92.7

The great increase in gross earnings is nearly all net, and thus the increase in net earnings is the enormous sum of $478,565, or 92¾ per cent.—equal to 69 cents per share of stock. If we considered this alone we might suppose the road was enjoying extraordinary prosperity. But the reason why the gain is so large is because gross and net earnings were extraordinarily small in June last year—so much so as to attract universal attention and cause some anxiety among the stockholders. We made some comment on them when they were reported last year, and found sufficient explanation for the decrease in earnings in the almost total cessation of corn shipments, which are usually the largest item in the traffic of the road in June. Since the corn movement is very light this year also, it is encouraging to see so large a gain.

For ten successive years the mileage, gross and net earnings of the Chicago, Burlington & Quincy Railroad in June have been:

Years.	Miles.	Gross earnings.	Working expenses.	Net earnings.
1874	1,263	$1,060,269	$462,674	$597,595
1875	1,263	948,105	471,589	476,516
1876	1,342	1,099,300	526,307	572,993
1877	1,620	957,735	567,376	390,359
1878	1,656	897,090	633,692	263,398
1879	1,733	1,160,968	612,027	548,941
1880	2,597	1,682,956	834,283	848,673
1881	2,712	2,083,802	962,788	1,121,014
1882	3,168	1,437,164	921,041	516,123
1883	3,230	1,937,916	993,228	994,688

We see here that though the gross earnings this year were $500,000 more than last year, they were $146,000 *less* than in 1881, which, however, was as remarkable for abnormally large earnings as last year was for abnormally small ones. The Denver line was open in June last year, but that was the first month it was open. The earnings per mile were $768 in 1881 and $600 this year. The working expenses were larger than in any previous year, as was to be expected with the larger mileage. The net earnings, though $478,000 more than last year, were $126,000 less than in 1881. They were never equaled in any other June, however, and in spite of the larger mileage show a very satisfactory return.

For the half-year ending with June the earnings and expenses of the last two years compare as follows:

	1883.	1882.	Increase.	P. c.
Gross earn.	$11,405,203	$9,155,616	$2,249,587	24.6
Expenses	6,023,656	5,265,103	758,553	16.3
Net earn.	$5,381,547	$3,890,513	$1,491,034	38.3

The gain in gross earnings is large, and in net earnings it is very large—nearly a million and a half. The increase in the capital of the company—stock and bonds—aside from the issue to purchase Hannibal & St. Joseph stock, requires about $650,000 more than last year to pay interest and the 8 per cent. dividends. The Hannibal & St. Joseph issue will require about $450,000 more, but doubtless dividends on the preferred stock will provide for at least $250,000 of this. Thus the increase of net earnings in the first half of this year would appear to be $640,000 more than the increase of interest and dividends for the whole year, which is 92 cents per share of stock.

For eight successive years the earnings and expenses of this road in the first half of the year have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1876	$5,085,578	$2,994,534	$2,691,044
1877	5,523,637	3,34 ,042	2,18 ,595
1878	6,417,790	3,643,571	2,774,219
1879	6 510,239	3,6 9,367	2,880,872
1880	9 659,605	4,647,724	5,011,881
1881	9,098,547	4 910,604	4,157,943
1882	9,155,616	5,265,103	3,890,513
1883	11,405,203	6,025,656	5,381,547

Thus the gross earnings of the six months this year have been much larger than in any previous, and also the expenses, leaving the net earnings, however, larger than ever before, though only $370,000 more than in 1880, which was a wonderfully prosperous year.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

East & West, of Alabama.—Extended westward to Broken Arrow, Ala., 25 miles. Gauge, 3 ft.

New York, West Shore & Buffalo.—Track laid from East Buffalo, N. Y., east to Bowmansville, 10 miles.

Northern Pacific.—Extended from Missoula, Montana, eastward 30 miles, and from Helena west 22 miles. The *Yellowstone Park Branch* is completed to a point forty-two miles south of Livingston, Montana, an extension of 37 miles.

West Pennsylvania & Shenango Connecting.—Completed from Coalville, Pa., southward to Butler, 22 miles.

This is a total of 146 miles of new railroad, making 2,942 miles thus far this year, against 5,782 miles reported at the corresponding time in 1882, 3,180 miles in 1881, 2,704 miles in 1880, 1,346 miles in 1879, 1,005 miles in 1878, 943 miles in 1877, 1,231 miles in 1876, 607 miles in 1875, 916 miles in 1874, 2,028 miles in 1873, and 3,485 miles in 1872.

CHICAGO THROUGH RAIL SHIPMENTS EASTWARD for the week ending Aug. 7 for four successive years have been:

	1880.	1881.	1882.	1883.
Tons	42,789	54,090	24,813	33,487

This complete pool report for the first time includes the shipments by the New York, Chicago & St. Louis, and the Chicago & Atlantic, and consequently the total Chicago through shipments eastward in this as well as previous years. We see that they were 8,686 tons (35 per cent.) *more* than last year, when the rate was the same, but 21,203 tons (39 per cent.) *less* than in 1881, when the rate was 40 per cent. lower than now, and 9,302 tons (21¾ per cent.) less than in 1880, when the rate was a fifth higher. The earnings from these shipments, approximately, were:

1880.	1881.	1882.	1883.
$256,734	$164,070	$124,065	$167,435

But the six roads which have had the whole of this traffic heretofore had but 86.7 per cent. of it this year, and their earnings from it consequently were but $145,618, which is less than in either 1880 or 1881. The percentage carried by each line during the week in each of the last three years has been:

	G.T.	Mich. Cen.	Lake Shore.	Ft. Wayne.	C. St. L. & P.	B. & O.	N. Y., C. & At.	C. & St. L.
1883	12.5	15.3	15.9	22.5	11.9	8.6	8.0	5.3
1882	2.2	27.3	19.3	31 1	9 2	10.9	...	...
1881	12.1	29.9	24.1	22.1	8.1	3.7	...	...

The two new roads have a much smaller proportion of the traffic than in some previous weeks—at least the Chicago & Atlantic has. The Vanderbilt roads suffer especially. Of the shipments carried by the six roads in operation last year, the Michigan Central this year carried but 17.7 per cent. and the Lake Shore 18.3 per cent, in all 36 per cent., against 46.6 last year and 54 in 1881. In the last named year these two roads carried 29,532 tons, and in 1882 11,563 tons, against 10,463 tons this year.

For seven successive weeks the shipments by the six roads in the old pool have been, in tons:

Week ending						
June 23.	June 30.	July 7.	July 14.	July 21.	July 30.	Aug. 7.
27,449	30,718	23,584	27,456	27,603	24,453	29,058

There is a considerable gain over previous weeks in the last of these weeks, but the shipments remain very small for the season, and the incomplete report for the week to Aug. 11 indicates a decrease rather than an increase since. This report gives the total eastward shipments, through and local, of flour, grain and provisions, as 26 808 tons, against 27,921 in the previous week. Last year the shipments did not increase materially till the last week of August. The Chicago shipments must not be confounded with the total Northwestern grain movement. Chicago does not feel the effect of the new crop greatly for some weeks after the grain shipments have become large. Stocks of grain have not been increasing at Chicago, and the only symptom (a very good one, however) of a greater demand for transportation is a considerable advance in lake rates, which are 75 per cent. higher than during most of July.

THE SOUTHEASTERN RAILWAY has been the subject of several reports during the past week, one being that it had been bought by persons in the interest of the Grand Trunk and the Central Vermont. It does not appear, however, that anything has been done. The people interested in the Canadian Pacific hold all the bonds as security for their loan, and are said to have the option to purchase the road—presumably to purchase the stock, which is probably nearly all held by Mr. Barlow and his associates. Were they or any one else to do this, they would have to assume the floating debt, said to be large, and then be prepared to pay the interest on the bonds, to prevent the Canadian

Pacific syndicate from obtaining the road by foreclosure. As we showed last week, the net earnings in the two years ending with June, 1882, came far short of meeting the interest, and it is not probable that they increased much last year, or will during the current year.

It does not seem probable that the Grand Trunk and Central Vermont would be willing to give $3,800,000 for these roads simply to keep the Canadian Pacific from getting them. They would not keep that road out of New England in that way. Only 100 miles of the road, it must be remembered, serves to connect Montreal with the Passumpsic Railroad, and to suppose that the Canadian Pacific, with more than 3,000 miles of road west of Montreal, and the companies that make the line from Boston to connect with it, with several hundred miles of road, will go without a connection if they should lose the Southeastern is absurd. This fact will prevent either the Canadian Pacific or the Grand Trunk from paying more for the Southeastern than it is worth. Its value to them will be gauged approximately by its net earnings, which are very small. It is worth more to the New England companies, however—to the Passumpsic River or the Central Vermont—than it can be to any one else, as it fits well into their existing systems, and gives them a northern terminus at an important traffic centre. But the Central Vermont might not be able to use it as a through line if it had it, as the Grand Trunk has a line of its own by which it interchanges freight with the Central Vermont 27 miles south of Montreal, and at all events it could use but a very little of the Southeastern for a through line. It would seem, therefore, that the road is worth more to the Connecticut & Passumpsic Rivers Company than to any other company. It indeed already owns chiefly the 20 miles from Newport to Richford, which the Southeastern works under a lease; but it is a very small company, and it will not lose the connection should the Canadian Pacific obtain the Southeastern. It is thus hard to see who has interest enough in the property to prevent its falling into the hands of the Canadian Pacific. Were the companies which form the line to Boston consolidated, as they ought to be, they would probably long ago have owned the Southeastern, or some other line to Montreal.

THE MINNEAPOLIS MILLERS, who have probably on the whole enjoyed lower freight rates for their flour than have existed anywhere else in the world, are now complaining that the low rates on grain shipped by way of Duluth puts them at a great disadvantage, unless grain rates to Minneapolis are reduced. It is imaginable that the rates from Duluth or other Lake Superior ports may become so low that nothing can be done for Minneapolis. Duluth is no further than Chicago from Buffalo by lake; if rates thence should be no higher than from Chicago or Milwaukee, it is not easy to see how it can be made as cheap for grain coming from North Minnesota and Dakota to go by way of Minneapolis. From Fargo, through or near which all grain from the Northern Pacific, the Red River Valley and Manitoba must pass, to Duluth is 252 miles; to Minneapolis, by the Northern Pacific, 263 miles (233 miles by the Manitoba); to Milwaukee, 537; to Chicago, 652 miles. It is not easy to see what the railroads northwest of Minneapolis—the Northern Pacific and the Manitoba—can gain by making rates on wheat lower to Minneapolis than to Duluth. The lines from Minneapolis to Lake Michigan, of course, are interested in having all the grain go by way of Minneapolis if possible; and they may be expected to do all they possibly can to prevent the wheat's going to Lake Superior, as in that case they cannot get it. But if lake rates from Duluth are no higher than from Chicago (they are somewhat and probably always will be, but perhaps only a very little higher), they can do very little. *Any* charge whatever on wheat or flour from Minneapolis to Lake Michigan in that case would put Minneapolis at a disadvantage so long as navigation is open. The railroads, we believe, get 20 cents per 100 lbs. for carrying wheat or flour from Minneapolis to Chicago. This is 12 cents per bushel, or about four times the present lake rate from Chicago to Buffalo. Thus with the lake rate twice as high from Duluth as from Chicago, the difference against Duluth would be but 3 cents per bushel, and even if the Northwestern railroads should carry at trunk-line summer rates they would have to charge over 11 cents per 100 or 6.6 cents per bushel from Minneapolis to Chicago. Thus, with this wholly unprofitable rate Duluth would still have an advantage of 3.6 cents per bushel on all grain which reaches it as cheaply as Minneapolis.

But Duluth has always been nearer to the Red River Valley—to the hard wheat region—than Chicago, and as near as Minneapolis; yet nearly the whole of the great flour manufacture of Minneapolis has grown since the railroads were built to Duluth, and the Northern Pacific has found it, or thought it, necessary to change its chief terminus from Duluth to St. Paul and Minneapolis. Duluth has never heretofore received an important amount of grain—never as much as 4,000,000 bushels of wheat; and last year, when the production of the district most accessible to it was much greater than ever before, less than 3,200,000 bushels of grain of all kinds. Why it should suddenly become a formidable competitor of Minneapolis we do not understand. Perhaps, however, considering the relative situations, the puzzle is that it has not received more grain heretofore.

THE MOVEMENT OF NEW WHEAT continues very light for the season, though it has increased largely since the third week of July. To show the course of the wheat movement definitely we give this week the average weekly receipts of wheat at the eight Northwestern markets in June and the actual receipts in each of the five weeks following, for five successive years:

	1879.	1880.	1881.	1882.	1883.
Av. in June...	1,324,148	922,424	1,562,112	627,578	857,966
Week to July 7.	1,734.275	913.508	1,044.166	848,580	445.595
" 14.....	2, 13,533	2,281,240	1.135,423	1,595.224	462,833
" 21.....	2,455,596	3,209.537	1,198,660	3.101.184	613.570
" 28...	2,732,407	3.456,718	1,711,001	3,986,077	938,932
Aug. 4.....	2,624,154	2,754,772	1,767,390	3,459,361	1,546,574

In every year except 1881 and this year there has been a marked increase in wheat receipts in the second week of July, and there was also in 1878, which is not given in this table. In 1881, however, the increase did not appear until the fourth week of July, and then was small, and in the last two weeks in the table wheat receipts that year but little greater than in June. This year again the increase did not come till the fourth week of July, and then was very small, and in the week to Aug. 4, the receipts were less than in the corresponding week of 1881, even. The increase in the last named week over the June average was 689,000 bushels this year; last year it was 2,832,000 bushels, in 1881 (bad harvest) 205,000, in 1880 1,832,000, and in 1879 it was 1,300,000 bushels. Were we to go back to 1878 we should find a similar great increase from the June average (789,417 bushels) beginning the second week of July, and reaching 2,094,600 bushels in the week ending Aug. 4. These statistics confirm in a remarkable way the reports of a very light winter wheat crop. The movement so far has been much lighter than in 1881 even. There doubtless may be and are some other causes besides a small production which have tended to make the receipts exceptionally small of late, but that must have been the chief cause of the small wheat receipts since the middle of July.

THE CROP PROSPECTS, as reported by the Department of Agriculture for August 1, show the condition of spring wheat to be the same as last year at the same time, and better than in any previous year since 1877. The acreage is 5 per cent. greater this year, and as the yield of spring wheat was 117 million bushels last year, with no injury to the crop during harvest, or after Aug. 1 (and there has been none to speak of), the crop should be about 123 millions this year, or six millions more than last year. But the most favorable accounts of the winter wheat crop (which is all harvested) indicated that it was about 90 millions less than last year, so that we seem likely this year to have a total crop of about 420 millions, against 504 last year. There was, however, a decrease in acreage, which would, with the same yield, have lessened the production of winter wheat 14 millions, and of all wheat nine millions. The fate of the spring wheat is now settled substantially, though in Minnesota and Dakota a large part, perhaps the larger part, remains to be cut, and some damage from bad harvest weather is possible.

Corn has generally been doing well, but is late, and there has rarely if ever been a season when an early frost was so much to be feared; in fact, the frost must be late not to do great damage everywhere north of the latitude of Springfield, Ill.

Cotton has suffered much from drought in Texas, Georgia and South Carolina, and less in other states, but recent rains in most of these states have prevented the very great damage that was feared, and the same may be said of corn in Nebraska.

LAKE RATES have advanced further within two weeks, and this week are reported as 3½ cents a bushel for corn, and 3¾ for wheat from Chicago to Buffalo. Shipments are not large compared with previous years, but they are larger than before for some time, and there is said to be a scarcity of carriers in the grain trade.

Canal rates have also advanced materially to 3 cents a bushel for oats, 4 for corn, and 4½ for wheat, from Buffalo to New York, which are fully as high as last year, when the boats paid 1 cent a bushel toll.

These advances are favorable to an increase in the rail grain movement, but they still leave the water rate from Chicago to New York about 8¼ cents for corn and 9 cents for wheat, against 14 and 15 cents by rail.

Ocean rates meanwhile have declined. Two weeks ago quotations were 4½d. to 5d. per bushel for grain by steam from New York to Liverpool; last Wednesday they were 3¾d. to 4d. The decline in ocean rates about equals the advance in inland rates.

THE SCRAP HEAP.

Locomotive Building.

Mr. A. B. Underhill, Superintendent of Motive Power of the Boston & Albany road, has applied to a new freight engine built in the Springfield shops of that road a novel apparatus for throwing part of the weight of the tender upon the driving wheels of the engine, in order to increase the adhesion. The coupling by which the tender is attached to the locomotive consists of levers and cams so arranged that the coupling itself constitutes the lifting apparatus and acts automatically.

The shops of the Central Division of the Philadelphia & Reading road at Ashley, Pa., have just completed a new passenger engine with 5 ft. 8 in. drivers.

Car Notes.

The Terre Haute Car Works in Terre Haute, Ind., have just completed a number of flat cars for the Panama Railroad.

The Northern Pacific shops at Tacoma, Wash. Ter., are building several combined mail and passenger cars and a number of flat cars for the road.

The Dallas Car & Agricultural Implement Works in Dallas, Tex., were sold Aug. 7 to satisfy several judgments, and were bought by J. B. Wilson for $5,900, subject to a mortgage for $12,500. The purchaser intends to start up the works soon.

Milliken, Boyd & Co. in Youngstown, O., are building a number of freight cars for the Pittsburgh, Cleveland & Toledo road. They are also building a number of Goodwin's patent dump cars.

A company has been organized at Lexington, Ky., to build shops in that town for the manufacture of cars. The capital stock is to be $500,000, and it is proposed to build wagons as well as cars.

Bridge Notes.

The Keystone Bridge Works in Pittsburgh are very busy, having a number of orders on hand for bridges to be built.

The works of the National Bridge Co. in Montreal, Canada, are completed and ready for business. The machinery is driven by a Westinghouse automatic engine of 60 horse-power.

Iron Notes.

Topton Furnace in Berks County, Pa., will be started up shortly by Wm. M. Kaufman & Co., the lessees.

The E. & G. Brooke Iron Co. has put its No. 1 furnace at Birdsboro, Pa., out of blast, after a run of three years and five months.

The Pittsburgh Forge & Iron Co. is running its works in Pittsburgh full double turn.

The men employed by the Bethlehem Iron Co. in Bethlehem, Pa., have abandoned their organization, and are generally returning to work.

Dilworth, Porter & Co. in Pittsburgh are turning out 100 tons of railroad spikes a day.

The Newburg Furnace Co. has sold its Emma Furnace in Cleveland, O., to the Union Rolling Mill Co., and the furnace will be put in blast at once.

The blast furnace of the Manchester Iron & Steel Co. in Pittsburgh will be kept in blast for the present.

Princess Furnace at Ashland, Ky., has been sold to parties who will, it is said, take it down and use the material in building a new furnace near Lowmoor, Va., on the line of the Chesapeake & Ohio road.

The Vulcan Tank & Boiler Works in Pittsburgh started up last week, after a long stoppage.

Manufacturing Notes.

The Westinghouse Machine Co. in Pittsburgh has recently sent a Westinghouse automatic engine of 60 horse-power to the Tucson Electric Light Co. in Tucson, Arizona. An engine of the same pattern and of 125 horse-power was recently delivered to the Allegheny County Light Co. in Pittsburgh, making seven of these engines in use by that company. A small engine of the same make used in Pittsburgh is coupled direct to a six-light dynamo, and has often been run for a week without stopping, making 1,000 revolutions a minute.

C. B. Rogers & Co. in Norwich, Conn., recently shipped two heavy planers to Sydney, New South Wales, to fill an order.

General Railroad News

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Albany & Susquehanna, annual meeting at the office in Albany, N. Y., Sept. 4.

Richmond & Danville, special general meeting, at the office in Richmond, Va., Sept. 12, at noon.

Dividends.

Dividends have been declared as follows:

Middletown & Crawford, 3 per cent., semi-annual, payable Sept. 1.

North Pennsylvania (leased to Philadelphia & Reading), 2 per cent., quarterly, payable Aug. 25, to stockholders of record Aug. 15. This company increases its dividend from 1¾ to 2 per cent., under the terms of the lease.

Railroad and Technical Conventions.

The *Road-Masters' Association of America* will hold its first regular meeting in St. Paul, Minn., Sept. 12.

The *Master Car-Painters' Association* will hold its annual convention in Baltimore, Sept. 19.

The *New England Road-Masters' Association* will hold its first annual meeting in Boston, Sept. 20.

The *American Street Railway Association* will hold its next meeting in Chicago, Oct. 9.

The *American Institute of Mining Engineers* will hold its autumn meeting in Troy, N. Y., during the second week in October.

The *General Time Convention* will hold its fall meeting at the Grand Pacific Hotel in Chicago, Oct. 11.

The *Southern Time Convention* will hold its fall meeting at No. 46 Bond street, New York, Oct. 17.

The *American Association of Railroad Superintendents* will hold its fall meeting in Washington, Oct. 23.

Western Association of General Passenger and Ticket Agents.

A meeting of the Association was held in Chicago, Aug. 8. There were present G. H. Smith, St. Louis & Cairo; R. S. McMurray, Central Iowa; James Charlton, Alton; Percival Lowell, Chicago, Burlington & Quincy; William Hill, Chicago & Eastern Illinois; M. L. Ettinger, Chicago & Iowa; A. V. H. Carpenter, Chicago, Milwaukee & St. Paul; W. H. Stennett, Chicago & Northwestern; J. J. Blower, Pekin & Southwestern; John Egan, Cincinnati, Indianapolis, St. Louis & Chicago; D. Edwards, Cleveland, Columbus, Cincinnati & Indianapolis; H. M. Bronson, Indiana, Bloomington & Western; H. R. Dering, Jeffersonville, Madison & Indianapolis; W. Smith, Lake Erie & Western; J. W. Moss, Louisville & Nashville; B. B. Anderson, Peoria, Decatur & Evansville; E. A. Ford, Pennsylvania Company; C. C. Cobb, Pittsburg, Cincinnati & St. Louis; D. Wisbart, St. Louis & San Francisco; J. M. Chisbrough, Vandalia Line; J. C. Ernst, Chicago, St. Louis & Pittsburgh; J. C. Buchanan, Sioux City & Pacific; S. W. Snow, Chicago & Atlantic; J. M. Hall, Wheeling & Lake Erie; P. W. Tensdale, Chicago, St. Paul & Omaha; E. F. Dodge, St. Paul & Duluth. President H. C. Townsend not being present, Mr. A. V. H. Carpenter was chosen Chairman. Mr. J. M. Chisbrough acted as Secretary.

The forenoon session was taken up in discussing the question of rates on theatrical baggage. It was finally agreed to adopt the agreement recently made by the roads in the Chicago Association, limiting the amount of baggage to each theatrical ticket to 250 pounds, the same as on commercial baggage. Donkeys, educated goats, dogs, etc., will not be received by the railroads, but must be shipped by express.

The afternoon session was principally occupied in discussion as to the maintenance of rates from interior points, but no action was taken on account of the small attendance at the meeting.

Cincinnati Railroad Club.

This recently-organized club purposes making an effort to secure permanent quarters. It is proposed to build a club-house with a large room for meetings, and smaller rooms to be used for a library, a reading-room and for social gatherings. The meeting-room can be used for official and other meetings, as well as for those of the club. It is thought that $5,000 will be sufficient, and an effort is to be made to raise that sum.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—The following circular from Traffic Manager J. F. Goddard is dated Aug. 1:

"For the purpose of encouraging immigration and the greater development of the resources of the country tributary to this line the department of immigration is hereby created. Mr. G. B. Schmidt, heretofore European Agent, is appointed Commissioner of Immigration in charge of this department, with headquarters at Topeka. Appointment to take effect this date."

Denver & Rio Grande.—It is understood that the presidency of this company has been offered to Mr. A. J. Cassatt, but it is still uncertain whether he will accept the office.

Eastern Maine.—This company has elected Eugene Hale President; G. W. Kimball, Vice-President and Treasurer; L. A. Emery, Clerk. The road is leased to the Maine Central.

Georgia Railroad Commission.—The Governor of Georgia has reappointed Major Campbell Wallace a member of the Board of Railroad Commissioners for a second term.

Harrisburg & Southwestern.—Mr. Robert H. Sayre, of Bethlehem, Pa., is President of this new company.

Middletown & Crawford.—At the annual meeting in Middletown, N. Y., Aug. 7, the following directors were chosen: E. M. Madden, H. R. Wilcox, Albert Bull, Samuel Robertson, R. M. Crosby, Alex. Thompson, Hugh J. Jewett, H. R. Blanchard, Robert Harris, Thomas C. Platt, B. W. Spencer, E. S. Bowen, A. R. Macdonough.

New York, Danbury & Boston.—This company has been organized with the following directors: George W. Bartholemew, Pliny Jewell, Hartford, Conn.; Wm. P. Abendroth, Elwood Burdsell, G. W. Quintard, Portchester, N. Y.; W. R. Bergholz, New Rochelle, N. Y.; H. W. Ford, R. N. Hazard, D. H. McAlpin, J. L. Macaulay, Christopher Meyer, C. J. Osborne, New York.

New York, Ontario & Western.—Mr. John Babcock having resigned his position as General Road-Master, the office is abolished, and each division road-master will hereafter report to his division superintendent.

Norfolk Southern.—At the annual meeting in New York, Aug. 15, the following directors were chosen: James Benedict, Edmund W. Corlies, Henry J. Cullen, Jr., Wm. G. Dominick, Wm. H. Male, Wm. H. Phillips, Alfred H. Porter, John N. Whiting, George C. Wood.

Pensacola & Atlantic.—Mr. C. W. Gorringe is appointed General Freight Agent and Mr. F. C. Shepard General Passenger Agent, succeeding Mr. Barnard Brown, resigned.

Portsmouth & Dover.—At the annual meeting in Portsmouth, N. H., Aug. 8, the following directors were elected: Frank Jones, Daniel Marcy, Joseph A. Walker, John S. Treat, Charles H. Sawyer. Frank A. Christie, James G. Lothrop. The road is leased to the Eastern Railroad Company.

Postal Telegraph Co.—Mr. John W. Mackey has been chosen a director and president of this company in place of J. B. Ehrhardt, resigned. It is said that Mr. Mackey has agreed to put a large amount of capital in the company.

Richmond & Danville.—At a meeting of the board, held Aug. 10, Messrs George F. Baker, Calvin S. Brice, George S. Scott and George I. Seney were chosen directors in place of John T. Branch, Robert Harris, T. M. Logan and A. D. Shepard, resigned. The new directors are members of the Seney syndicate, which now holds a large interest in the stock. The board subsequently elected Calvin S. Brice First Vice-President, in place of T. M. Logan, resigned.

Rome, Water'own & Ogdensburg.—Mr. H. M. Britton will hereafter act as Purchasing Agent, with office in Oswego, N. Y. Mr. Britton is General Manager of the road.

Mr. C. L. Martin is appointed Auditor, with office at Oswego, N. Y.

Mr. J. D. Remington is appointed Assistant Superintendent of the Eastern Division, which comprises all of the road east of Richland, with office at Watertown, N. Y.

Mr. W. H. Chauncey is appointed Assistant Superintendent of the Western Division, which comprises all of the road west of Richland, with office at Oswego, N. Y.

Mr. G. H. Haselton is appointed Superintendent of Motive Power and Machinery, with office at Oswego, N. Y. These appointments took effect Aug. 8.

St. Louis, Alton & Terre Haute.—Mr. B. F. Blue has been appointed General Freight and Passenger Agent of the roads operated by this company, to succeed H. S. De Pew, resigned; appointment and resignation to take effect Sept. 1. Mr. Blue was recently on the Chesapeake, Ohio & Southwestern road.

Toledo, Cincinnati & St. Louis.—Col. Edward A. Flint has been appointed Chief Engineer by the Receiver.

PERSONAL.

—Mr. Barnard Brown has resigned his position as General Freight and Passenger Agent of the Pensacola & Atlantic road.

—Mr. H. S. DePew has resigned his position as General Freight and Passenger Agent of the St. Louis, Alton & Terre Haute road.

—Hon. George Marston, a prominent lawyer and for four years Attorney-General of Massachusetts, died at his residence in New Bedford, Mass., Aug. 14, aged 61 years. He was a director of the Old Colony Co. for a number of years.

—Mr. John Babcock, who has been Road-Master of the New York, Ontario & Western road for some 10 years past, has resigned that position to become Superintendent of the works of the West Shore & Ontario Terminal Co. at Weehawken.

—Mr. Robert E. O'Brien has resigned his position of Assistant Manager of the Oregon Railway & Navigation Co., his duties as Manager of the Northern Pacific Terminal Co. and Chief Engineer of the Oregon & Transcontinental Co. claiming his undivided attention.

—Mr. W. J. Palmer has resigned his position as President of the Denver & Rio Grande Railway Co., preferring to devote his time to his duties as President of the Mexican National Construction Co. and the Colorado Coal & Iron Co. The board passed resolutions accepting his resignation and thanking him for his labors on behalf of the company.

—The inventory of the estate of the late Chester W. Chapin shows that he was the possessor of 4,000 shares of Boston & Albany Railroad stock valued at $613,160; 429 shares of Boston & Maine valued at $61,428.12; 24 shares of Boston & Providence at $3,360; 1,360 shares of Connecticut River Railroad at $190,040; 517 shares New York, New Haven & Hartford Railroad at $85,879.63; 2,466 shares Ware River Railroad at $308,000, and 1,000 shares of the New York Elevated Railroad at $110,125.

—Mr. B. F. King, Supervisor of Trains of the Pittsburgh Southern Division of the Baltimore & Ohio, was instantly killed on the afternoon of Aug. 10. He was riding through Washington, Pa., on the engine of a freight train, when the draw-bar between the engine and tender broke and he was thrown down on the track, the wheels of the tender and several cars passing over him. Mr. King was 40 years old, and had been on the Baltimore & Ohio some time, having been previously for 13 years a conductor on the Allegheny Valley road.

—Chief Engineer Wainwright, of the Pittsburgh, McKeesport & Youghiogheny road was recently presented with a handsome gold watch by the members of the Engineer Corps of the road. Mr. P. F. Brendlinger made the presentation, and the speeches made are given in full as a model for similar occasions:

Brendlinger—"Here is a watch."
Wainwright—"Is this a watch?"
Brendlinger—"It is."
Wainwright—"Thanks."

—Mr. Joseph A. Dodge, who died at his home in Plymouth, N. H., Aug. 10, was born in New Boston, N. H., in 1823, and received a little more than an ordinary education. When still a boy he came to Boston, and after working for a time on the Middlesex Canal and afterward on the Boston & Lowell road, he was appointed Train-Master of the Concord road. When the Boston, Concord & Montreal road was first opened to Tilton, N. H., in 1848, he was made station agent at the terminus. A year later he was appointed Master of Transportation of the road, and in 1857 he was appointed Superintendent, holding that position for 21 years, until 1878, when he was made General Manager. About a year ago he resigned on account of ill health and went to Southern California, where he bought a house in Los Angeles, and where his health improved very much. A few months ago he returned to New Hampshire on a visit, but has never recovered from the fatigue of the journey. He leaves a wife and one child, a daughter, who is now married. He was three times elected to the New Hampshire Legislature, and once declined a nomination for Congress. He leaves a considerable fortune. Mr. Dodge was highly esteemed by his associates in business; on the death of John E. Lyon, the directors of the company elected him President, but he preferred the office of General Manager.

TRAFFIC AND EARNINGS.

Coal.

Coal tonnages for the week ending Aug. 4 are reported as follows:

	1883.	1882.	Inc. or Dec.		P.c.
Anthracite	628,763	630,162	D.	1,399	0.2
Semi-bituminous	129,006	84,672	I.	44,334	52.2
Bituminous, Penna	55,676	5[illegible],112	D.	5,564	10.7
Coke, Penna	65,524	44,987	I.	20,537	45.6

The anthracite market is reported dull, and shipments continue large. Prices are still considerably below the company's list.

Prices of semi-bituminous coals are also low, and it is said that some sales of Clearfield have been made at $3.50 per ton at tidewater, for steamer use.

The coal tonnage of the Pennsylvania Railroad for the week ending Aug. 4 was:

	Coal.	Coke.	Total.
Mined on line of road	123,369	52,750	176,119
Received from other lines	45,643	12,774	58,417
Total	169,012	65,524	234,536

The total tonnage this year to Aug. 4 was 6,937,853, against 6,423,736 tons to the corresponding date last year, an increase of 514,117 tons, or 8.0 per cent.

The coal tonnage of the Chesapeake & Ohio Railroad for the seven months ending July 31 was as follows:

	1883.	1882.	Increase.	P. c.
Coal	544,634	481,036	63,598	13.2
Coke	63,960	52,235	11,725	22.5
Total	608,594	533,271	75,323	14.1

The increase this year in coal was in gas coal and in shipments from the New River Region.

Chicago coal receipts for the three months from May 1 to July 31 were as follows:

	—Anthracite.—		—Bituminous.—	
	1883.	1882.	1883.	1882.
By lake	339,239	256,063	97,032	61,014
By rail	70,723	106,013	567,271	459,101
Total	409,962	362,076	664,303	520,115
Per cent by rail	17.2	29.3	86.9	87.9

The increase this year in anthracite was 46,886 tons, or 12.9 per cent.; in bituminous, 144,188 tons, or 27.7 per cent. The increase in anthracite receipts was entirely by lake, the rail receipts showing a considerable decrease.

San Francisco coal receipts in July were 69,400 tons. For the seven months ending July 31 the receipts were 365,000 tons, a decrease of 23,800 tons, or 6.1 per cent., from last year.

The official statement of anthracite coal tonnage for July and the seven months ending July 31 is made as follows by Mr. John H. Jones, Official Accountant, the statement including the entire production of anthracite coal, excepting that consumed by employes, and for steam and heating purposes about the mines:

	—July.—		—Seven months.—	
	1883.	1882.	1883.	1882.
Phila. & Read. / Central of N. J.	1,026,481	653,499 / 416,072	4,671,763 / 1,745,389	3,560,173 / 2,304,445
Lehigh Valley	497,741	548,743	3,340,470	3,168,435
Del., Lack. & W.	427,646	441,135	2,644,714	2,460,393
Del. & H. Canal Co.	279,[illegible]62	296,932	1,810,423	1,602,303
Pennsylvania R. R.	240,609	218,489	1,449,578	1,275,289
Penn'a Coal Co.	121,597	151,503	774,780	756,383
N. Y., L. E. & W.	22,349	30,876	183,353	137,680
Total	2,615,686	2,757,249	16,626,453	15,325,101

Central of New Jersey tonnage is now included in tonnage of Philadelphia & Reading. Lehigh Valley tonnage for July, 1883, includes the production of the mines of the State Line & Sullivan, amounting to 6,029 tons. In addition the tonnage credited above there were 42,748 tons transported from mines by Delaware & Hudson Canal Co., during July, which is included in tonnage of other interests.

The stock of coal on hand at tidewater shipping points, July 31, 1883, was 502,159 tons; on June 30, 592,309 tons; decrease, 90,150 tons, or 15.2 per cent., during the month.

The decrease for the month was 141,563 tons, or 5.1 per cent.; increase for the seven months, 1,301,352 tons, or 8.5 per cent.

Cumberland coal shipments for the week ending Aug. 11, were 55,998 tons. The total shipments this year to Aug. 11, were 1,435,686 tons, an increase of 838,911 tons, or 140.5 per cent., as compared with the same period last year.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1883.	1882.	Inc. or Dec.		P c.
Seven months ending July 31:					
Bur., Cedar Rap. & No.	$1,476,815	$1,489,676	D.	$12,831	0.8
Central Pacific	13,320,899	14,232,619	D.	711,720	5 0
Chesapeake & Ohio	2,183,333	1,715,905	I.	467,428	24.3
Eliz., Lex & B S	376,864	251,137	I.	125,725	50.1
Chi & West Michigan	871,817	831,587	I.	40,230	4.8
Cin., Ind., St. L. & Chi.	1,364,274	1,419,653	D.	55,379	3 9
Cleve., Akron & Col.	191,414	274,9 6	D.	19,498	7.1
Det., Lansing & No.	864,635	899,910	D.	35,275	3 9
Flint & Pere Marquette	1,443,086	1,200,670	I.	242,416	20.2
Florida Transit	281,329	234,820	I.	46,509	19 8
Grand Trunk	9,745,780	8,976,375	I.	769,405	8 6
Green Bay, Win. & St. P.	218,210	2 6,487	I.	11,723	5.7
Gulf, Col. & S. F.	1,008,225	581,919	I.	421,306	72.4
Ill. Central, Ill. lines	3,555,637	3,787,131	D.	234,474	6.2
Iowa lines	1,077,937	1,054 015	I.	23,9:2	2.3
Southern Div.	2,183,877	1,779,605	I.	404,272	22.7
Kentucky Central	426,868	384,384	I.	42,484	11.1
Marquette, H. & Ont.	402,367	647,412	D.	245,045	37.8
Rich. & Danville lines:					
Char., Col & Aug.	440,564	373 6:0	I.	66,955	17.2
Net earnings	186,078	71,185	I.	114,893	161.8
Col. & Greenville	401,891	379 420	I.	31,471	8 5
Net earnings	122,9 6	48,641	I.	74,365	152 8
Rich. & Danville	2,637,088	1,918,998	I.	118,090	6.2
Net earnings	861,945	531,135	I.	33 ,850	62 7
Virginia Midland	876,034	771,458	I.	104,586	13 6
Net earnings	320,589	234,386	I.	86,151	39 8
Western N. C.	176,976	115,707	I.	61,269	57 8
Net earnings	56,761	8,035	I.	48,726	606.4
St. L., Alton & T. H.:					
Main line	754,446	742,085	I.	12,361	1.6
Belleville line	459,361	463,875	D.	24,514	5.3
Scioto Valley	289,944	285,961	I.	3,983	1.4
Six months ending June 30:					
Bur., Cedar Rap. & No.	$1,280,856	$1,291,400	D.	$10,544	0.8
Net earnings	323,744	424,148	D.	100,404	23.7
Danbury & Norwalk	97,802	9 ,270	I.	7,532	8.3
Des M. & Ft. Dodge	136 407	172,058	D.	35,651	20.7
Net earnings	18,433	59,809	D.	41,376	69 0
Houston, E. & W. Texas	145,495	122,323	I.	23,172	20.6
Net earnings	87,898	.....		.....	....
Oregon & California	436,212	.....		.....	....
Net earnings	82,641	.....		.....	....
Union Pacific	13,412 960	13,78 ,225	D.	367,265	2.7
Net earnings	6,255,711	5,978,058	I.	277,653	4.6
Utah Central	574,480	774,543	D.	200,063	25 9
Net earnings	290,877	468,818	D.	177,941	37.5
Month of June:					
Danbury & Norwalk	$18,127	$17,628	I.	$489	2.8
Houston, E. & W. Texas	21,681	23,344	D.	1,661	7.2
Oregon & California	79,574	.....		.....	....
Net earnings	24,568	.....		.....	....
Union Pacific	2,330,132	2,509,453	D.	178,321	7.1
Net earnings	1,101,653	1,349,076	D.	247,126	18.3
Utah Central	79,829	131,237	D.	51,408	39 3
Net earnings	34,106	75,573	D.	41,467	54.6
Month of July:					
Bur., Cedar Rap. & No.	$195,989	$198,276	D.	$2,287	1 2
Boston, Hoosac T. & W.	39,967	29,856	I.	10,111	33 9
Central Pacific	2,024,000	2,076,648	D.	53,648	2.6
Ches. & Ohio	336,575	316,787	I.	19,688	6.2
Eliz., Lex. & Big S.	60,237	51,666	I.	8,571	16.5
Chi. & West Mich.	117,076	111,949	I.	5,127	4 5
Cin., Ind., St. L. & Chi.	185,540	217 198	D.	31,658	14.6
Cleve., Ak. & Col.	43,985	39,4 5	I.	4,590	11.6
Connotton Valley	32,443	24,849	I.	7,6 3	30.4
Det., Lansing & No.	121,255	122,891	D.	1,699	1 3
Flint & Pere Marquette	184,427	148,608	I.	35,924	24.1
Florida Transit	29 627	26,189	I.	3,438	13.2
Green Bay, Win. & St P.	26,343	26,792	D.	449	1 7
Gulf, Col. & S. F.	166,555	93,782	I.	72,853	77 5
Ill. Cent., Ill. lines	519,758	616,782	D.	97,024	15.2
Iowa lines	147,495	140,052	I.	7,443	5.3
Southern Div.	24 ,6 5	222,6 9	I.	17,926	8.1
Kentucky Central	81,038	7 ,027	I.	10,011	14 1
Marquette, H. & Ont.	140,776	177,858	D.	36,052	20.8
Richmond & Danville lines:					
Charlot e, Col. & Aug.	46,785	40,788	I.	5,997	14.6
Columbia & Greenville	35,023	35,013	I.	10	.
Rich. & Danville	272,882	244,389	I.	27,492	11 4
Virginia Midland	140,777	122,696	I.	24,081	19 6
Western N. C.	30,552	20,184	I.	10,368	51.3
St L., Alton, & T. H.:					
Main Line	99,422	130,943	D.	31,564	24.2
Belleville Line	54,721	73,640	D.	18,919	25.5
Scioto Valley	47,926	4 ,462	I.	2, 64	4.5
Shenandoah Valley	74,376	45,556	I.	28,820	63.2
First week in August:					
Chi. & Alton	$183,023	$177,349	I.	$5,674	3 2
Chi & Eastern Ill.	8,022	44,121	D.	5,099	12.5
Chi. & Grand Trunk	45,091	57,741	D.	12,650	21 6
Chi., Mil & St. Paul	412,000	34 ,615	I.	71,385	20 9
Chi. & Northwestern	488,300	447,000	I.	41,300	9 2
Chi., St P., Minn. & O.	97,563	82,494	I.	15,074	18 3
Denver & Rio Grande	139,6 0	121,260	I.	18,4 0	15.2
Louisville & Nash.	269,170	224,795	I.	44,375	19 7
Northern Pacific	214,380	164,240	I.	50 160	30.6
St. L. & San Fran.	78,500	71,500	I.	7 0 0	9.7
St. P. & Duluth	31,839	24,250	I.	7 589	31 6
Union Pacific	620,000	660,000	D.	40,000	6.0

Grain Movement.

For the week ending Aug. 4 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past seven years:

Year.	Northwestern receipts.	Northwestern shipments. Total.	By rail.	P.c. by rail.	Atlantic receipts.
1877	4,940,613	4,285,095	950,575	22 2	3,525,053
1878	6,353,446	4,872,921	1,449,950	30.8	6,153,764
1879	6,271,648	5,588,755	1,870,352	33.3	8,402,315
1880	7,262,597	6,528,553	2,125,251	32 6	8,236,866
1881	6,052,700	4,952,203	2,213,188	44.7	5,549,732
1882	5,774,769	5,129,111	2,217,259	43.2	5,678,659
1883	5,017,993	4,649,343	1,362,401	29.3	3,797,301

Thus the receipts of the Northwestern markets for the week this year were 757,000 bushels less than in the corresponding week of last year and smaller than in any corresponding week since 1877. They were, however, 831,000 bushels *more* than in the previous week of this year, and were the largest since the middle of June, and with the exception of two weeks in June were the largest since March.

The increase over the previous week was chiefly in wheat, but to a considerable extent in corn, which is some indication that better corn prospects are leading farmers to market their old stock more freely. If the increase were in in corn as far south as St. Louis, it might indicate only that harvest is over and the farmers have more time to haul grain to market, but it is chiefly at Chicago, which received more than three-fourths of all the corn. But the increase in wheat receipts is mainly at St. Louis and Toledo, which receive winter wheat almost solely, which they get from a territory much south of Chicago, where the harvest is early. Wheat, however, was but 30 per cent. of the total grain receipts this year, while in the corresponding week of last year it was 60 per cent.

The shipments of these markets for the week this year were 480,000 bushels less than in the corresponding week of last year and less than in any other year since 1877, but were no less than 1,719,000 bushels (59 per cent.) *more* than in the previous week of this year, and were the largest since the middle of June. The shipments down the Mississippi were no less than 530,215 bushels, or 11.4 per cent. of the whole, which is twice as much as in any other week since April; but the rail shipments also were larger than before for six weeks, though not large.

The Atlantic receipts for the week were 1,861,000 bushels less than in the corresponding week of last year, and less than in any other year since 1877—not half as great as in 1879 or 1880. These also reflect the movement of the new wheat crop, as is shown especially by the arrival of 1,012,000 bushels at Baltimore, which is the first port to feel the new crop. But the total grain receipts were but 417,000 bushels more than the week before, and but about equal to the average weekly receipts in June. Compared with previous weeks of this year, New York received less than in any other week for three months, but the Baltimore receipts were the largest of the year with one exception.

Exports from Atlantic ports for the week ending Aug. 4 for four successive years have been :

	1880.	1881.	1882.	1883.
Flour bbls	119,992	125,992	168,265	144,066
Grain in bu	7,055,953	4,434,519	4,037,498	2,204,318
Total.....	7,595,917	5,001,283	4,794,690	2,852,615

Thus the exports this year were 1,942,000 bushels (40 per cent.) less than last year, 2,148,000 (30 per cent.) less than in 1881, and 4,743,000 (62½ per cent.) less than in 1880.

San Francisco exports for July, the first month of the California crop year, were as follows, flour in barrels and grain in bushels, flour being reduced to wheat in the totals :

	1883.	1882	Decrease.	P. c.
Flour.....	69,111	107,594	38,483	35.8
Wheat.....	689,092	1,714,442	1,025,350	59.8
Total, bushels.	1,034,647	2,252,412	1,217,765	54.1

The harvest in California was very late this year, and the new wheat has not yet begun to come forward freely.

Exports of California barley by sea in July were 29,967 centals, against 7,492 centals in July, 1881, an increase of 22,475 centals, or 300 per cent.

Crop Prospects.

The United States Department of Agriculture has made its report of the condition of crops Aug. 1. No report is made for winter wheat, which was all harvested by Aug. 1. The average condition of spring wheat is reported 97 per cent. of a fully good condition, which is the same as last year at the same date, but higher than in any previous year since 1877. With this condition, and the same progress after Aug. 1 as last year, the larger acreage this year would make the crop of spring wheat just about 123 millions this year, against 117 millions last year. The decrease in winter wheat is not yet well established, there being especially very great differences in estimating the California crop (from about 40 million to 54 million bushels), but it is probably from 90 to 100 millions, and if the winter-wheat decrease is 90 millions, then our total wheat production this year will be about 420 millions, against 504 last year. There is now no room for improvement in spring wheat, as it is fully grown where not fully ripe. It may be injured by bad harvest weather, but weather has been good so far and probably half the crop is harvested. More than one-third of it is in Iowa and Nebraska, where most of the wheat was cut about the first of August; and at the beginning of last week harvesting was general as far north as the Winona & St. Peter Railroad.

The report makes the condition in Wisconsin 90, Minnesota 98. In North Dakota, Cass and Richland counties promise a better yield than last year (when it was below the average), but the other counties a lighter yield. In South Dakota, the wheat is better than last year. The prospect in Minnesota is said to be for an average yield of 13⅓ bushels per acre, though the condition is but 98. The average yield in Minnesota has been but 12.3 bushels per acre for five years past, and 13⅓ bushels per acre is 110 per cent. of this average. In the last five years there has been no year when the Minnesota average has been as much as 13⅓ bushels, but this year an unusual proportion of the acreage is in the northwest part of the state, where the yield has always been much above the average of the rest of the state.

The average condition of corn is reported to have improved only from 88 July 1 to 89 Aug. 1, against 83 Aug. 1 last year and 99 in 1879, when the yield was larger than it ever has been since. The condition was lower this year than it ever has been before Aug. 1 since 1870, except last year, but the acreage is so large that a production of 1,700 million bushels is estimated, if nothing happens to injure the crop, against 1,617 last year, 1,195 in 1881, 1,717 in 1880, and 1,755 in 1879. The corn is late, however, and the cool weather since Aug. 1 has still further checked its growth, so that it is unusually liable to damage by frost. A killing frost as far south as Springfield, Ill., would this year probably destroy 200 million bushels of corn, and with favorable weather hereafter, a frost holding off till October the production might be 150 to 200 millions mor, than the Department has estimated. Neither of these events is improbable; but perhaps because the summer so far has been unusually cool there is more probability than usual of a hot September and late frosts. The Department reports but slight improvement in corn in July in Illinois, Missouri and Kansas, which is certainly contrary to the tenor of other reports, which almost uniformly, so far as we have observed, have said that the improvement was great, though not enough in many or most places to make up for the bad condition July 1. A drought reduced the condition of corn in the South during July, and the same result was caused in Michigan (where corn is not a very important crop) by too much rain. The condition Aug. 1 in leading corn-growing states is reported as follows: Ohio, 89; Indiana, 95; Illinois, 86; Missouri, 83; Kansas, 97; Nebraska, 84; Iowa, 85; Wisconsin, 85; Michigan, 68; Kentucky, 97. In the North Atlantic States the condition is generally good: 90 in New York, 101 in New Jersey, 99 in Pennsylvania, 93 in Virginia; in the South Atlantic and Gulf States east of the Mississippi it is bad, 83 in North Caolina, 70 in South Carolina, 74 in Georgia, 80 in Alabama, and 87 in Mississippi. In the Southwestern States it is good: 100 in Louisiana, 93 in Texas, 87 in Arkansas and 89 in Tennessee.

The corn crops in the Northwest, owing to its very backward condition and the unseasonably cool weather in the first third of August, is really in precarious condition. At this time it has usually little to fear except an early frost, the ears being fully developed and filling fast. Now it still needs growing weather, and a frost which in most years would not be thought early—one in the last half of September—would do great damage.

Cotton the department reports to have fallen off in condition during July in every state except Virginia, which raises very little, and Tennessee, which raises much less than the states further south. The average for the whole country is reported as 84 Aug. 1 against 90 July 1. The greatest declines in condition are from 93 to 78 in Georgia and from 91 to 80 in South Carolina. The averages in different states Aug. 1 were 87 in Virginia and North Carolina, 80 in South Carolina, 78 in Georgia, 93 in Florida, 83 in Alabama, 85 in Mississippi and Louisiana, 89 in Texas, 83 in Arkansas and 90 in Tennessee. The report says: "While the relative condition of cotton, compared with returns of former years, is unpromising, the volume of the crop depends largely upon the more critical period from August to October."

The condition of *oats* for the whole country Aug. 1 was 100 and better than before since 1878, except last year.

Barley averaged 95, the same as last year, but higher than in any other year since 1874. *Potatoes* rank 101. *Tobacco*, 88.

Reports since the department statistics (Aug. 1) show further damage to cotton, nearly all by drought, chiefly in Texas and South Carolina, but to a considerable extent also in Georgia, and somewhat in Alabama and Mississippi. The drought seems to have been relieved before the end of last week in South Carolina and Georgia by rains, which on the coast (at Charleston and Savannah) are reported to have amounted to 6.8 in. of rainfall—about equal to the average rainfall of two *months*, and six times as great as the July rainfall in many parts of Texas. Much damage that cannot now be repaired has been done by drought, but the weather hereafter will have a great effect on the yield, as the cotton plant, with favorable weather and late frost matures new balls until late in the fall or near winter, though the growth of the shrub is nearly determined by the end of August.

Rains have come in time to save the corn in Nebraska, which was suffering greatly from drought.

Chicago-St. Louis Rates.

A dispatch from Chicago, Aug. 15, says: "A secret conference of officials of the three roads running between this city and St. Louis was held here to-day to make a truce in the fight over passenger fares which has continued for the past two weeks. It is understood that an agreement was made, and that the passenger agents of the roads will hold a meeting to-morrow to arrange details."

Colorado Pool.

A dispatch from Chicago, Aug. 14, says: "A meeting of representatives of the Chicago, Burlington & Quincy, the Union Pacific, the Atchison, Topeka & Santa Fe, and the Denver & Rio Grande Railroads, comprising the Colorado pool, was held here this afternoon to consider the claim of the Atchison Railroad for an increased percentage from April 1 to July 1 of the present year, in view of the order of the Federal Court compelling it to pro rate its business with the Denver & New Orleans road. The day was occupied in hearing arguments on this question. The matter will be taken under advisement by the arbitrator, who will announce his decision at Boston on Monday next, when another meeting of the Executive Committee of the pool is to be held to consider the question of a complete rearrangement of percentages."

OLD AND NEW ROADS.

Allegheny Valley.—Surveys have been made for an extension of the Plum Creek Branch from its present terminus at Saltsburg Crossing, Pa., southeast to the main line of the Pennsylvania Railroad at Greensburg, a distance of about 20 miles. The branch is now 7 miles long, leaving the main line at Verona 10 miles from Pittsburgh. The extension would pass through a section rich in coal and iron ore, and would also complete a loop from Pittsburgh to Greensburg which might be useful.

Atlantic & Pacific.—This road was formally opened Aug. 11, when a train crossed the bridge over the Colorado River with a number of officers of the road on board. Regular through trains have not yet begun to run.

Augusta & Knoxville.—It is reported that the controlling interest in this road has been bought in the interest of the Central Railroad Co., of Georgia. It is said that the road will be leased to the Central, the lessee to pay interest on the bonds and 2 per cent. on the stock, provided the bondholders will agree to a reduction of the interest from 7 to 6 per cent. They will probably be willing to do this in exchange for the Central guarantee, as the interest has not been paid regularly. The road is in operation from Augusta, Ga., to Greenwood, S. C., 70 miles.

Baltimore & Ohio.—The Maryland Board of Public Works has approved the company's plan for the bridge over the Susquehanna River at Port Deposit on the new Philadelphia Branch. The plans provide for a bridge 90 ft. above high water and without a draw. The company engages to keep a tug in constant readiness to assist vessels to pass under the bridge, charging them nothing for the service.

Boston & Lowell.—This company has lately completed at Lowell, Mass., a new engine-house with stalls for 15 locomotives, and so designed that 10 more stalls can be added. Plans have been prepared for a repair shop of brick, 100 by 200 ft., adjoining the engine-house, and work has been begun on the foundations. The old round-house has been pulled down, and its site is to be used for an extension of the freight house.

Canada Southern.—This company has given notice of its intention to issue $6,000,000 new 5 per cent. second-mortgage bonds, the proceeds of which are to be used in payment for second tracks and other additions to property, and for the new bridge over the Niagara River. The issue of these bonds was provided for in the agreement with the Michigan Central Co., under which the road is now worked.

Central, of Georgia.—An extension of the Blakely Branch of the Southwestern Division from Blakely, Ga., southwest to Columbia, Ala., is urged upon this company by the people on the line. The extension would be about 12 miles long, and the company will probably build it if a reasonable amount of local aid can be secured.

Chicago, Burlington & Quincy.—The Nemaha Line of this company in Nebraska is now under construction from Tecumseh, its present terminus, west to Beatrice, 33 miles. Arrangements have also been made to continue this extension from Beatrice westward to a point on the main line to Denver.

Chicago, Milwaukee & St. Paul.—A dispatch from Milwaukee, Aug. 10, says: "Judge Dyer this morning rendered a decision in the famous case of William Barnes, trustee, against the Chicago, Milwaukee & St. Paul Railway Co., a case which, in its varied phases, has been litigated in the United States Supreme and Circuit courts for the past quarter of a century.

"The decision of the Court is in favor of the St. Paul Railway Co., the decision of the special master being reversed. Barnes' motion for a modification of the interlocutory decree so as to allow parties having claims based upon any of the $1,740,800 of bonds to present and support them was denied, the court reaffirming its former decision that these bonds had been exchanged for stock in the Milwaukee & Minnesota Co., and were therefore no equitable lien upon the mortgaged property. It is decided that as nothing had been presented concerning these bonds to the special master, the trustee, Barnes, cannot be permitted to constitute himself the agent of these bondholders, and that the claims sought to be enforced against the mortgaged property by the trustee and certain of the holders of the $1,740,800 of bonds are inadmissible. The motion of other bondholders to be allowed to intervene is denied. The decision then turns to the special master's report. It is stated that the Court did not know how much of the $259,200 of bonds were in any degree equitable claims upon the property, and a reference was therefore made to a special master, who reported that $21,500 of these bonds, held by various claimants, amounting to about $90,000, with interest, were justly due.

"It is decided that these bondholders have at least tacitly consented to the Barnes foreclosure, and in consequence of their neglect to prosecute their claims, the claims should not be allowed. They are inequitable and unjust, and although the amount of the principal found due by the special master is comparatively small, yet to allow the claims would be to create a precedent for the payment of similar and larger claims. Besides, other rights have grown up which are entitled to the protection of the law. The court, therefore, refuses to allow the bonds and interest coupons decided by the special master to constitute a lien upon the property. The bill of complaint of the trustee named in the bonds, William Barnes, is therefore dismissed. But the case will not end here. Judge Dyer himself, in his preliminary remarks, stated that in preparing the decision Judge Drummond and himself had acted upon the presumption that the case would go to the United States Supreme Court."

Chicago & Western Indiana.—A dispatch from Chicago, Aug. 15, says: "At a meeting of the directors of the Chicago & Western Indiana road, held here yesterday, it was decided to accept the compromise ordinance making the terminus of the road in Chicago at Polk street, and it was also determined to enter upon the immediate erection of a depot building to cost $500,000, and covering the block bounded by Third and Fourth avenues and Polk and Taylor streets."

Cincinnati, Wabash & Michigan.—It is proposed to extend this road from its present terminus at Anderson, Ind., southward about 45 miles to Shelbyville, where connection will be made with the Cincinnati, Indianapolis, St. Louis & Chicago and the Jeffersonville, Madison & Indianapolis roads.

Cornwall.—Surveys have been made for an extension of this road from Cornwall, Pa., southward through Mt. Hope to Manheim on the Reading & Columbia road. The distance is about 10 miles. This will complete a short connection between the Lebanon Valley and the Tremont branches of the Reading road on the north and the Columbia Branch on the south, which may be very convenient for shipments of coal and iron ore.

Detroit, Mackinac & Marquette.—The Marquette *Mining Journal* says that this company has bought the docks and yards of the Cleveland Iron Co. in Marquette, Mich. This purchase is thought to have immediate relation to the proposed extension of the road from Marquette westward into the iron district.

East & West, of Alabama.—Track on this road is now laid from the crossing of the Selma Division of the East Tennessee, Virginia & Georgia road westward to Broken Arrow, Ala., a distance of 40 miles, completing the connection with the coal fields. The road will soon be opened for traffic, when the force now employed on it will be transferred to the section from the Selma Division crossing eastward to Cedartown, Ga., which will complete the road.

Great American & European Short Line.—Dispatches from Halifax and St. John say that the work which had been begun on this road in Nova Scotia and New Brunswick has been stopped, and that the contractors have not received their pay. A good deal of grading has been begun in Nova Scotia, but in New Brunswick little has been done beyond making surveys. The scheme seems to have collapsed completely.

Harrisburg & Southwestern.—This company has been incorporated to build a railroad from a point near Harrisburg, Pa., southwest to a point on the Maryland state line near Conococheague Creek, in Franklin County. It will be about 90 miles long, and will be generally parallel to the Cumberland Valley road. It is to be a branch of the Harrisburg & Western or Vanderbilt road.

Harrisburg & Western.—Proposals will be received at the office of the American Construction Co., in the Mills Building, New York City, until noon of Aug. 31, for building seven tunnels, aggregating about 36,000 linear feet, on the line of this road between Harrisburg, Pa., and the Youghiogheny River, together with one section of about one mile in length at each end of each tunnel. Also for building the masonry of the bridge over the Susquehanna River at Harrisburg. Plans, profiles and specifications can be seen, and all necessary information obtained, at the offices of the division engineers at Harrisburg, Everett, Bedford and Somerset, Pa.

The company will require satisfactory evidence from bidders of their responsibility and of their ability to complete any work that may be allotted to them, in accordance with the terms of their bids. All proposals must be sealed and addressed to George H. Kent, Secretary of the American Construction Co., as above.

Illinois Central.—This company reports the earnings of its lines in July as follows :

	1883	1882.	Inc. or Dec.	P. c.
In Illinois.....	$519,758	$616,782	D. $97,024	15.7
In Iowa.....	147,495	140,052	I. 7,443	5.3
Southern Division.....	240,625	222,658	I. 17,967	8.1
Total.....	$907,878	$979,492	D. $71,714	7.3

The Land Department reports for July, 1883, sales of 2,992.10 acres of land for $12,967.06. Cash collections on land accounts were $11,045.48 for the month.

A new transfer boat 285 ft. long is being built at Jeffersonville, Ind., for the Cairo transfer. It will have two tracks on deck, each long enough to hold 9 box cars, and will have machinery of the most approved pattern.

Indiana, Illinois & Iowa.—This company offers to establish its repair shops in Kankakee, Ill., provided the people of that place will give 10 acres of land and $20,000 in money.

La Crosse, Iowa & Southwestern.—A conditional contract has been made for the construction of this road, which is to run from La Crosse, Wis, southwest to Charles City, Ia., about 90 miles, with a projected extension to Kansas City. The board has resolved to increase the capital stock to $20,000,000 and to authorize the issue of $12,000,000 bonds.

Maine Central.—At the stockholders' meeting in Augusta, Me., Aug. 14, a committee of five was appointed to confer with the parties in interest and see if certain modifications cannot be made in the lease of the Eastern road to the Boston & Maine which are considered necessary to protect the interests of the Maine Central. In the event of a failure to secure the proposed changes, the committee is instructed to call another meeting. The stockholders adjourned subject to the call of the committee.

Milwaukee, Lake Shore & Western.—The graders on the extension of this road have now nearly completed their work some 18 miles beyond the Wisconsin line and into Michigan. Tracklaying is progressing slowly, having been very much delayed by the failure of rails to arrive when expected.

Nashville, Chattanooga & St. Louis.—It is stated that as soon as the extension of the McMinnville Branch to Sparta is completed, work will be begun on a further extension from Sparta, Tenn., southeast to the coal mines at Bon Air.

New York, Danbury & Boston.—This company has been organized to build a railroad from the Harlem River at Second avenue in New York by way of Portchester, N. Y., and Ridgefield, Conn., to Danbury, when connection will be made with the New York & New England road, giving that road a through line to New York. It is proposed to use the road-bed graded several years ago for the Ridgefield & New York road as part of the new line.

New York Railroad Taxes.—The following corporations of New York state have reported to the State Comp-

troller at Albany the amounts of their earnings within this state for the year ending June 30, 1883, as follows:

	Gross earnings.	Tax levied.
New York Central	$28,929,144	$144,647
Boston & Albany	1,069,412	5,347
Utica & Black River	815,472	4,077
N. Y. C. Sleeping Car Co	405 381	2,026
Del., Lack. & W., lessee Utica, Clinton & Binghamton roads	146,485	732
N. Y. & Harlem	670,950	3,354
Del., Lack. & W., as lessee	3,160.032	15,800
Lake Shore & Mich. So	1 021,401	5,107
Southern Central	508.480	2,042
Boston, Hoosac T. & W	319 520	1,597
Manhattan	6,245,589	31.227
Buff., Pitts. & West	511,493	2,557
Syra., Chen. & N. Y.	94,234	471
Syra., Bing. & N. Y.	1.019.602	5,098
Sodus Bay & Southern	47,001	235
Newburg, Dutch. & Conn	149,828	749
Elmira State Line	55.658	278
Elmira, Jeff. & Canandaigua	375,749	1,878
Elmira & Williamsport	77,517	387
Chemung	202.404	1.012
Genesee Valley	7.811	39
Olean, Brad. & Warren	60,571	....
Greenwich & Johnsonville	33,972	170
Adams Express Co	11,738	58
Albany (street) Railway	132.847	664
N. Y., Chi. & St. L	134,989	674

The tax levied under the law is one-half of 1 per cent. on the gross earnings.

New York, West Shore & Buffalo.—On the western end of this road track has been laid from East Buffalo, N. Y., east to Bowmansville, 10 miles. Tracklaying is also in progress from Churchville to the Monroe County line and near Fairport, and the work was to begin at Red Creek this week.

Plans for very extensive improvements at the Weehawken terminus of the road on the Hudson River have been made. The plans include a large passenger station and ferry-house, a number of piers for shipping, transfer piers for local and through freight, two large grain elevators, coal docks, extensive stock-yards and a large slaughter-house. These improvements are to be made by a separate corporation, known as the West Shore & Ontario Terminal Co., and this company has made arrangements to issue $12,000,000 bonds to be secured by first mortgage on this terminal property. The improvements, it is said, are to be made gradually, as needed for the business of the road, and the bonds will be issued as required to pay for the work.

Northern Pacific.—Work is now in progress on the branch from this company's line to Seattle, Wash. Ter. This branch leaves the company's line from Tacoma to the Carbonado mines at a point 10 miles northeast of Tacoma, and then runs northward 21 miles to a junction with a line running from Seattle to the Newcastle mines, about 10 miles from Seattle. Nearly all the grading of the 21 miles is completed, and tracklaying has been begun. The line out of Seattle, which was of 3 ft. gauge, has been changed to standard gauge. The distance from Tacoma to Seattle by this line will be 41 miles.

On the Yellowstone Park Branch the track is now laid from Livingston, Montana, southward 42 miles, leaving about 15 miles to be laid to completed. The tracklaying force has been temporarily taken off to assist in the completion of the main line, but the work will be resumed as soon as the main line is opened.

On the main line the track has been laid from Missoula, Montana, eastward 30 miles, and from Helena westward 22 miles, leaving a gap of 64 miles only. On this gap tracklaying is progressing very rapidly, and it is expected that the rails will be connected by the last of August, or about a week in advance of the formal opening, which is now set for Sept. 8.

The laying of the last rail and the formal opening of the road will take place in the presence of a large party of officers of the road and invited guests, and will be celebrated with much ceremony. Extensive preparations have been made for the event.

Ogdensburg & Lake Champlain.—This company makes the following statement for the first quarter of its fiscal year, from April 1 to June 30:

	1883.	1882.	Inc. or Dec.	P.c.
Earnings	$149,900	$154,.00	D. $4.400	2.9
Expenses	119.800	133,400	D. 13,600	10.2
Net earnings	$30,100	$20,900	I. $9.200	44.0

The gain in net earnings has been made entirely by a reduction in the working expenses. The expenses were 79.92 per cent. of gross earnings this year, against 86.45 per cent. last year. The month of July, it is stated, shows a considerable gain in gross earnings, as well as in net receipts.

Pennsylvania.—The grading of the Ridgeway & Clearfield Branch is now nearly completed, and tracklaying has been begun. The branch extends from Ridgeway, Pa., on the Philadelphia & Erie Division, southward 27 miles to Falls Creek on the Low Grade Division of the Allegheny Valley road. It runs through a new coal district, and it will also be used, under contract, by the New York, Lake Erie & Western Co. as a southern outlet for its coal business. This branch will probably be extended from Falls Creek southeast, about 20 miles to a connection with the Tyrone Division.

Philadelphia & Reading.—Philadelphia papers report that this company intends to build a handsome passenger station in Philadelphia on the block bounded by Callowhill, Twelfth, Willow and Thirteenth streets, and that most of the property has already been bought for the company. The station, it is said, is intended to equal the Broad street station of the Pennsylvania road.

Another plan said to be under consideration is the building of an elevated road through Willow street to the Delaware River, to make connection by ferry with the Philadelphia & Atlantic City road.

Pine Creek & Susquehanna.—This company has been organized to build a railroad from Pike Mills, in Potter County, Pa., to Westport, in Clinton County, a distance of 40 miles. It is apparently to be an extension of the Addison & Northern Pennsylvania road.

Postal Telegraph Co.—This company has taken Mr. John W. Mackey, of the Bank of Nevada, as President. It is understood that Mr. Mackey will put in a large amount of capital, and that the company will at once begin to extend its lines from New York to the principal Western and Southern cities.

St. Paul, Minneapolis & Manitoba.—This company makes the following statement for July, the first month of its fiscal year:

	1883.	1882.	Decrease.	P.c.
Earnings	$613,100	$853.200	$24 ,100	28.1
Expenses	244,441	428.975	184,534	43 0
Net earnings	$368.659	$424,225	$55,566	13.1

The proportion of fixed charges for the month was $159,427, leaving a surplus of $209,232 for the stock.

Richmond & Danville.—This company's statement for July and the seven months ending July 31 is as follows:

	July.		Seven months.	
Gross earnings:	1883.	1882.	1883.	1882.
Char., Col. & Aug.	$46,785	$40,788	$440.564	$373,669
Col. & Greenville.	35.023	35,013	401,891	370,420
Rich. & Danville.	272,282	244.380	2,037.088	1,918,098
Va. Midland	146,777	122,696	876,034	771,458
Western N. C.	30,552	20,184	176,916	115,707
Total	$531.419	$463.061	$3,932,493	$3,550.192
Net earnings:				
Char., Col. & Aug.	14,119	589	186,078	71,185
Col. & Greenville.	*217	*3.069	122,906	48,641
Rich & Danville.	98,274	77,428	863,985	531,135
Va. Midland	57,' 37	42.729	320,539	234,386
Western N. C	10,645	5,815	56.761	8 035
Total	$179,858	$123,292	$1,550.269	$893,382

* Loss.

The general result for all the lines for the seven months is an increase of $382,301, or 10.8 per cent., in gross earnings; a decrease of $274,586, or 10.3 per cent., in expenses, and an increase of $656,887, or 73.6 per cent., in net earnings. All the lines show heavy gains both in gross and net earnings.

The gain is notable, because the comparison is with a very good year. On the Richmond & Danville especially the increase is remarkable, as the corn crop in North Carolina last year was a very good one, and there has been a much smaller quantity of grain carried southward than there was last year.

Southeastern, of Canada.—It was announced on Aug 10 that an offer to purchase this road had been made by a syndicate composed of George D. Chapman, of the National Construction Co., of New Jersey; Ashley Hibbard and Walter Shanley, of Montreal; and James Mitchell, of London, England, for $3,800,000 cash. This amount, it was stated, would be sufficient to pay off all the liabilities of the road and leave Mr. Barlow a surplus. This announcement seems to have been premature, although members of the syndicate proceeded to make an inspection of the road. Later advices indicate that a sale has been agreed on, provided the option given the Canadian Pacific does not interfere, but what price is to be paid does not appear. The object of the syndicate seems to be to buy the road as cheaply as possible in the hope of making money by reselling it either to the Canadian Pacific or the Grand Trunk. It does not seem probable, however, that a purchase can be completed without some opposition from the Canadian Pacific, which probably does not want to pay more for the road than the amount it has already advanced.

Telegraph Operators' Strike.—The strike still continues, but is certainly growing weaker, partly by the inevitable discouragement to the strikers resulting from its long continuance, and partly from the failure of the railroad operators to respond generally to the call to join in the movement. The operators have not given up hope as yet, but every day's delay necessarily weakens them, although there has been but little defection as yet.

During the past week the Western Union Co. has had a good deal of trouble from the cutting of wires in New York City and the neighborhood. The work has evidently been done by skilled hands, probably by some of the striking linemen, without the knowledge or approval of the great body of the strikers.

Texas & St. Louis.—The following description of this road, the completion of which was announced last week, is given by the St. Louis *Globe-Democrat*:

"The completion of the Texas & St. Louis Railway bridge over the Arkansas River, as published in Sunday's *Globe-Democrat*, opens for traffic a railroad of 3 ft. gauge, 723 miles long from its northern terminus at Bird's Point, Mo., to its southern terminus at Gatesville, Tex. There is but one completed branch, and that runs from Pawpaw Junction to New Madrid, Mo., a distance of 6 miles. The branch from McNeil to Magnolia is graded and bridged, ready for the iron. The road has a general southwesterly direction, and from its traversing a district peculiarly adapted to the raising of the Southern staple, is familiarly known as the 'Cotton Belt Route.' If you draw a line from Cairo through Malden, Jonesboro, Clarendon, Pine Bluff, Camden, Texarkana, Tyler, Corsicana and Waco to Gatesville you will about hit the general outline of the road.

"Bird's Point is on the right bank of the Mississippi, opposite Cairo, but Cairo is practically the place of arrival and starting of Texas & St. Louis trains, the transfer being effected by means of huge transfer boats, owned by the Illinois Central, with which the Cotton Belt Line has a valuable traffic agreement. The sleepers of the Texas & St. Louis run through to St. Louis, and similar arrangement is made for through freight when required to be carried without breaking bulk. As the route from Cairo to East St. Louis *via* the Illinois Central to DuQuoin and St. Louis, Alton & Terre Haute from Duquoin to East St. Louis is broad gauge, trucks are changed at Cairo on the Illinois Central hoist. Ten miles from Bird's Point the Texas & St. Louis crosses the Iron Mountain at Belmont Crossing. At Pawpaw Junction a branch runs 6 miles east to New Madrid. Fifty-six miles from Bird's Point the road reaches Malden. All of the country thus far passed through is fine wheat land. At Paragould the Crowley Ridge Branch of the Iron Mountain is crossed, and at Jonesboro connection is made with the Kansas City, Springfield & Memphis, which opens to Nettleton to-day. At Brinkley the Memphis & Little Rock road is crossed and connection made with a narrow-gauge feeder, known as the Batesville & Brinkley Railroad. At Clarendon connection is made with the Arkansas Midland (narrow-gauge), and just south of Clarendon the White River is crossed on a long and costly bridge. At Pine Bluff, 6 miles south of the Arkansas River, the Cotton Belt Line crosses and connects with the Little Rock, Mississippi River & Texas Railway. From Malden to Clarendon the country traversed is heavily timbered with oak, gum, bois d'arc, hickory and walnut, but from Clarendon to Pine Bluff the line runs through an elegant prairie. At Camden the Texas & St. Louis crosses the Camden Branch of the Iron Mountain. From McNeil will run the 6-mile branch to Magnolia. At Texarkana connection is made with the Iron Mountain and the Texas & Pacific. From Mount Pleasant a branch is graded for 40 miles in the direction of Dallas. At Pittsburgh the Jefferson Section of the Missouri, Kansas & Texas is crossed. The Texas & Pacific is crossed at Big Sandy; the International & Great Northern at Tyler; the Houston & Texas Central at Corsicana and Waco; and the Gulf, Colorado & Santa Fe at McGregor. This last is the most important crossing in the whole 723 miles, as it gives connection with Fort Worth, Dallas and Galveston. At present passengers change cars at McGregor, and freight is transferred, but a car-hoist will soon be erected and put in operation, when freight will go through without breaking bulk. For the time being the Texas & St. Louis ends at Gatesville. Where it will go from that point has not been settled, though extension to Laredo is talked of. * * * *

"Jonesboro is a right smart town, and has been selected as the proper location for the shops of the Arkansas Division of the Texas and St. Louis. Here, also, will be a hoist to change trucks for cars that are received from or go to the Kansas City, Springfield & Memphis road. From Jonesboro to Brinkley is a fine melon and fruit country. Brinkley is quite a town, so are Clarendon and Goldman, the latter named after Jacob Goldman, of St. Louis.

"Pine Bluff has a population of some 8,000 people, and here the company proposes to locate its general shops on 120 acres of land owned within the corporate limits. Here, too, will be the division headquarters of the Missouri & Arkansas Division of the road. The town of Fordyce has some fifteen or twenty stores already. Camden, one of the oldest towns in Arkansas, does a large business with all the surrounding country, and is growing rapidly. So important is the Camden trade deemed that New Orleans people are already agitating the project of a line between the two points. McNeil is a new town. Magnolia is the centre of the finest cotton district in the state, and from Lewisville to Texarkana the road passes through the Red River bottom, the finest cotton lands in the world.

"Tyler, Tex., is headquarters for the Texas Division. All the way from Texarkana to Tyler the road is fringed with saw-mills that feed on a magnificent pine country, like that along the Texas & Pacific, with the difference that the timber supply is now more remote on the Texas & Pacific than on the Texas & St. Louis by reason of having been earlier worked. From Tyler to Corsicana is cotton country again. Waco is noted for its religious and educational institutions and Gatesville is the county seat of Coryell County.

"The principal traffic of the road thus far has been in lumber and cotton, but it has not been at all developed for want of a thorough connection. Now that the Rob Roy bridge is finished and the line practically open, St. Louis may look for considerable trade along this road, and the fact that so many cotton men of this city are interested in the new enterprise should give every assurance that St. Louis will gain by the completion of the Cotton Belt Route. It is expected that freight can be handled very cheaply, as with but one or two exceptions the road has a very even grade. It has also but few curves. From Bird's Point south there is a stretch of over 50 miles without a curve, and the remainder of the line may be correctly described as a series of tangents.

"The most remarkable feature of the road lies in it bridges. Seven miles north of Pine Bluff the Arkansas River is crossed, where it is 1,542 ft. wide, by a bridge built by Rust, Coolidge & Co., of Chicago. Here, too, the bottom is very treacherous, necessitating a great depth of foundations, which go down 60 to 70 ft. below low water. The variation between high and low water is 32 ft., and the bottom chord of the bridge is 10 ft. above high water. Hence the iron cylinders forming the piers had to be made from 102 to 112 ft. deep. The bridge has five combination spans of 203 ft., two shore spans of 102 ft., and a draw span of 368 ft., with 74 ft. of trestle at the north and 150 ft. of trestle at the south approach, making a total of 1,801 ft. The two abutments and the seven piers outside of the pivot pier are made of two cylinders of 7 ft. diameter, placed 16 ft. apart centre to centre. The pivot pier has a central cylinder of 7 ft. diameter, with six outer cylinders, each of 4 ft. diameter, arranged at the angles of a regular hexagon. These carry a turn-table 26 ft. in diameter. All the cylinders are filled with concrete, made from Louisville cement and granite from Fouche Mountain. * * * *

"The Red River bridge was built by H. S. Hopkins & Co., of St. Louis. The trestle portion is 2½ miles long. There are three main spans, one of 60 ft., one of 250 ft. and a draw of 300 ft. The pivot pier is one single cylinder of 24 ft. diameter, whose foundations, on account of its size, had to be excavated by professional divers.

"The White River bridge is a pile trestle 4 miles long. The main bridge has two combination spans of 150 ft. and a draw of 358 ft. The draw pier has one central cylinder of 7 ft. diameter, and six others of 4 ft. diameter each, arranged at the angles of a regular hexagon.

"The Ouachita River bridge has a draw span of 225 ft. and 1¼ miles of trestle.

"The Saline River bridge has one 150 ft. span and ¾ mile of trestle work.

"So much for the physical peculiarities of the road. Freight trains will now run through on schedule time, and General Manager Geo. W. Ristine has issued a time card with rules and regulations, which contemplate a thorough passage service, commencing Aug. 12, at noon."

Toledo, Cincinnati & St. Louis.—A bill has been filed in the United States Circuit Court, in Cincinnati, by the Central Trust Co., of New York, trustee, to foreclose the mortgages on the Cincinnati Northern road, which became a part of this road by consolidation. The bill sets forth that two coupons on the $1,000,000 first mortgage bonds have been passed, and asks that a separate receiver be appointed for the lines formerly included in the Cincinnati Northern, in order that the interests of the bondholders may be properly protected.

Toronto, Grey & Bruce.—This road, it is stated by Canadian papers, has been leased to the Canadian Pacific Co. at a rental of $140,000 a year, the lease to take effect Aug. 1. The road extends from Toronto, Ont., to Owen Sound on Georgian Bay, 122 miles, with a branch from Orangeville to Teeswater, 74 miles. It was originally of 3 ft. 6 in. gauge, but was last year changed to standard gauge. It has never been very prosperous, having to compete with several other lines for the traffic of a not very populous country. An agreement with the Grand Trunk was made some two years ago but never carried into effect.

Union Pacific.—This company's statement for June and the half-year ending June 30, including leased lines, is as follows:

	June.		Six months.	
	1883.	1882.	1883.	1882.
Earnings	$2.330.152	$2,5 8.453	$13,412,960	$13,780,225
Expenses	1.228.179	1.150.374	7,157,249	7,802,167
Net earnings	1.101,953	$1.349.079	$6,255,711	$5,978,058

This shows for the half-year a decrease of $367,265, or 2.7 per cent., in gross earnings; but this was accompanied by a decrease of $644,918, or 8 3 per cent., the result being an increase of $277,653, or 4 6 per cent., in net earnings.

It is said that work will soon be begun on the extension of this company's Denver & South Park Division from its present terminus at Keystone, Col., to Leadville, the line requiring a long tunnel and other expensive work. The company will secure by this extension a line of its own to Leadville, without the necessity of using the Denver & Rio Grande tracks.

West Pennsylvania & Shenango Connecting.—The track is now all laid on this road, and it will very soon be opened for traffic. It is 22 miles long, extending from Coalville, Pa., on the Shenango & Allegheny road, southward to Butler, where it connects with a branch of the West Pennsylvania Division of the Pennsylvania Railroad. The road has been mainly built with the proceeds of an issue of $400,000 first-mortgage 6 per cent. bonds, further secured by a traffic contract with the Pennsylvania Railroad and the Shenango & Allegheny companies. It will be operated by the Shenango & Allegheny Co. as an extension of its road.